

# ENVIRONMENTAL ASSESSMENT BOARD



## ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARINGS

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VOLUME: 62

DATE: Monday, September 23, 1991

BEFORE:


HON. MR. JUSTICE E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

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ENVIRONMENTAL ASSESSMENT BOARD  
ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARING

IN THE MATTER OF the Environmental Assessment Act,  
R.S.O. 1980, c. 140, as amended, and Regulations  
thereunder;

AND IN THE MATTER OF an undertaking by Ontario Hydro  
consisting of a program in respect of activities  
associated with meeting future electricity  
requirements in Ontario.

Held on the 5th Floor, 2200  
Yonge Street, Toronto, Ontario,  
on Monday, the 23rd day of September,  
1991, commencing at 10:00 a.m.

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VOLUME 62  
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B E F O R E :

THE HON. MR. JUSTICE E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

S T A F F :

MR. M. HARPUR	Board Counsel
MR. R. NUNN	Counsel/Manager, Information Systems
MS. C. MARTIN	Administrative Coordinator
MS. G. MORRISON	Executive Coordinator







A P P E A R A N C E S

B. CAMPBELL	)	ONTARIO HYDRO
L. FORMUSA	)	
B. HARVIE	)	
J.F. HOWARD, Q.C.	)	
J. LANE	)	
J.C. SHEPHERD	)	IPPSO
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		PUBLIC HEALTH
G. GRENVILLE-WOOD		SESCI
D. ROGERS		ONGA

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D. HORNER	)	BOARD AND CHAMBER OF COMMERCE





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310	Document entitled, "Programmes Versus Regulations in Demand Management Applying the Total Customer Cost Test", with attached document precis.	10981
311	Precis Package	11029
312	One-page photocopy of small item from Globe and Mail.	11029
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313	Position Paper, Moose River/James Bay Coalition.	11158



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267.14	Ontario Hydro undertakes to provide a list of examples of modified application which meet the total customer cost test.	11006
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1 ---Upon commencing at 10:05 a.m.

2 THE REGISTRAR: Please come to order.

3 This hearing is now in session. Please be seated.

4 THE CHAIRMAN: Sir?

5 MR. KLIPPENSTEIN: Thank you, Mr.

6 Chairman. My name is Murray Klippenstein for Pollution  
7 Probe. With me is Mr. Bruce Lourie. I have prepared  
8 an exhibit which I would request be identified as such,  
9 to be used in aid of cross-examination.

10 THE CHAIRMAN: Number?

11 THE REGISTRAR: No. 310, Mr. Chairman.

12 Which one is that, Mr. Klippenstein?

13 ---EXHIBIT NO. 310: Document entitled, "Programs  
14 Versus Regulations in Demand Management  
15 Applying the Total Customer Cost Test",  
with attached document precis.

16 MR. KLIPPENSTEIN: I have also prepared a  
17 document precis which I suggest just be attached to the  
18 front of that exhibit. Copies of this exhibit were  
19 delivered to the witnesses on Friday and copies are  
20 available here for other people.

21 THE CHAIRMAN: Have you got it?

22 THE REGISTRAR: Yes.

23 Is the precis to be marked as an exhibit?

24 THE CHAIRMAN: No. It will just be  
25 attached.

1 THE REGISTRAR: That is fine.

2 MR. KLIPPENSTEIN: I propose to ask a  
3 number of questions this morning about the total  
4 customer cost test and the applicability of that test  
5 in the context of regulations.

6  
7 PAUL JONATHAN BURKE,  
8 AMIR SHALABY,  
9 MARION ELIZABETH FRASER,  
10 LYN DOUGLAS WILSON,  
11 WILLIAM OSBORNE HARPER,  
12 IAN DUNCAN MacLELLAN; Resumed

13 CROSS-EXAMINATION BY MR. KLIPPENSTEIN:

14 Q. Perhaps I could begin by asking you  
15 to turn to Exhibit 3, the Demand/Supply Plan, page 7-6.  
16 And, in particular, to the third column at the top, the  
17 second bullet in that column which reads, "Changes In  
18 Customers' Operating Costs". And what is in the  
19 brackets thereafter was struck out as a correction.

20 My question to the panel and whoever it  
21 is that would be appropriate to answer this is: I take  
22 it the changes in customers' operating cost referred to  
23 are the present value of future changes; is that  
24 correct?

25 MR. SHALABY: A. Yes. If you are  
evaluating an option that would live for many years,  
all of the bullets, all of the costs are evaluated for



1 every year and then present value to the year of  
2 evaluation.

3 Q. And that bullet, I take it, would be  
4 savings in customers' operating costs presumably rather  
5 than increases?

6 A. I think typically they are savings.  
7 There would be categories at times that would increase,  
8 but my understanding is that typically, there would be  
9 savings.

10 Q. Now, could you explain to me why that  
11 is not double-counting with the other half of the  
12 equation, namely, the avoided Hydro costs?

13 In other words, you have deleted the  
14 contents of the brackets; why would the whole bullet  
15 not be deleted?

16 A. Well, the total customer costs would  
17 include savings on Hydro's side and costs on Hydro's  
18 side and savings and costs on the customers' side, and  
19 that is part of the costs or savings on the consumers'  
20 side.

21 What would it be double-counting with?  
22 Where is that redundant or where is that counted first  
23 time?

24 Q. Does that bullet not refer to  
25 electricity which is not used by the customer; is that

1 it?

2 A. No. The intent of that is to say  
3 operating cost, costs of changing light bulbs, costs of  
4 cleaning equipment, maintaining and oiling and that  
5 kind of thing. The meaning of that was the operating  
6 costs associated with the more efficient equipment  
7 compared to the less efficient equipment, maintenance  
8 cost, that type of cost, not electricity related cost.

9 Q. I see. Thank you.

10 Now if I could refer you to the exhibit I  
11 have just filed, Exhibit 310, and if I could also refer  
12 you simultaneously to Exhibit 260, page 76. Exhibit  
13 260, page 76 is entitled "Financial Tests", and the  
14 first one being the total customer cost test.

15 Exhibit 310, which is entitled "Programs  
16 Versus Regulations In Demand Management" on page 1  
17 identifies a Case 1 and states:

18 "A version of the total customer cost  
19 test."

20 If you could examine the total customer  
21 cost test formula as stated in Exhibit 310 and tell me  
22 whether you agree that it is the same as the one  
23 proposed or put forward by Hydro in Exhibit 260.

24 A. It measures the same thing, yes.

25 Q. Now if you could take a look at that

1 Case 1 formula on Exhibit 310, and look at the example  
2 that is identified there and just tell me if this is a  
3 correct working through of that formula.

4 We have proposed an improved efficiency  
5 widget which uses less electricity than the standard  
6 widget.

7 Now, if the avoided total system costs  
8 for that improved efficiency widget are \$21, the total  
9 utility program costs for Hydro would be \$2.00 and the  
10 participant costs would be \$20. Then working through  
11 that formula, am I correct in the application of the  
12 formula that since \$21 is not greater than \$22, that  
13 widget would fail the total customer cost test?

14 A. Yes.

15 Q. If you could then turn to page 2 of  
16 Exhibit 310, which is labelled, "Case 2, Provincial  
17 Regulation".

18 And I would ask you to walk with me  
19 through that same example, but this time assume a  
20 provincial regulation mandating the improved efficiency  
21 widget.

22 In that scenario, would you agree the  
23 avoided total system cost for purposes of the test  
24 remain the same as in the previous example?

25 A. I think the arithmetic is one thing.

1 The other more significant thing perhaps to discuss  
2 first is, what are the assumptions that are well  
3 understood?

4 What you are assuming here is by  
5 provincial regulations, there would be no other costs  
6 except participant cost. That is what that chart  
7 shows.

8 Q. Well, let's look at that.

9 Am I correct in assuming that in some  
10 situations, for some electrical efficiency  
11 opportunities, total utility program costs would, in  
12 fact, fall to zero?

13 A. Maybe but we will let the energy  
14 management people address that. That is the assumption  
15 that I think needs a bit of investigation.

16 Q. Let's clarify that then.

17 MS. FRASER: A. That is, I think,  
18 certainly an over simplification. There may be some  
19 products that -- regulation, you can sort of by virtue  
20 of a regulation get rid of even the production of or  
21 the sale of less efficient activities; however, there  
22 are going to be compliance costs and inspection costs  
23 and costs of those sort.

1 [10:15 a.m.] It's also the cost in terms of  
2 determining what is in the regulation, what the  
3 standards are, how you test according to that standard,  
4 Ontario Hydro has always participated in that process  
5 with the Canadian Standards Association. We are  
6 certainly participating in that process with the  
7 Ontario Energy Efficiency Act. We have helped the  
8 Canadian Earth Energy Association develop installation  
9 standards for heat pumps, for example. So there  
10 definitely are costs involved in all of those things  
11 that right now accrue to the utility.

12 In terms of other provincial regulations  
13 and, you know, if you are just saying an either or  
14 situation, and all those costs then would-- Hydro then  
15 would not be involved in any of those things, those  
16 costs would still be accrued by somebody in order to  
17 put that regulation into place. So, you would almost  
18 need another -- it may not be the utility program cost,  
19 but something there called regulation costs, or  
20 whatever.

21 Q. I understand your point. Let me just  
22 focus on what my question was. Assume a provincial  
23 regulation, there will be some cases where the total  
24 utility program costs do in fact go to zero; is that  
25 right? There will be some cases?



1                   A. That will depend on how you wanted to  
2     implement it. If you said from now on Ontario Hydro  
3     does not get involved in any standard activity, which  
4     we have been for years and years, then that would be a  
5     big change. It would involve testing, standards  
6     development, work with the CSA. So, there are costs  
7     involved in that.

8                   Q. I am talking about a situation where  
9     there is already an existing regulation in place passed  
10    by, for example, the provincial government, since  
11    therefore the standard has already been developed and  
12    so on.

13                  A. But that's still a cost of the  
14    efficiency.

15                  THE CHAIRMAN: I guess perhaps - I hope I  
16    am following if well first thing Monday morning - would  
17    it be fair to say that if a standard for the same  
18    widget were put into place, that the program costs  
19    would be less than they otherwise would be absent a  
20    standard?

21                  MS. FRASER: I think that's probably true  
22    but they wouldn't be zero.

23                  MR. KLIPPENSTEIN: Q. Would you agree  
24    that in many cases they would be substantially less?

25                  MS. FRASER: A. I don't think we have



1 done enough research on that to generalize. There are  
2 certain regulations that are in place; for instance,  
3 right now the regulations for refrigerators really  
4 don't go very far at all in terms of, you know, you are  
5 not really getting an improved efficiency widget out of  
6 those regulations at this point in any sense of the  
7 word. So your assumptions about total system avoided  
8 cost may be not appropriate in that case.

9 Q. If I substitute for zero the words  
10 "total utility program costs less one dollar", that  
11 would likely be an accurate description in most cases;  
12 would you agree, conceptually? There is likely to be  
13 in most cases a drop in that particular figure in the  
14 scenario of a provincial --

15 A. It could be, it depends on the  
16 product that we are talking about. Some things it's  
17 quite easy to put regulations around, some things it's  
18 virtually impossible to put regulations around. So  
19 it's a continuum, right.

20 Q. I am assuming that there is a  
21 provincial regulation in place, therefore that means  
22 that this particular product is susceptible to  
23 regulation, the provincial government does in fact --

24 A. If there was a regulation in place  
25 then the avoided total system costs are zero because we

1 have already factored that in. There are no facilities  
2 being avoided because they were never planned to be  
3 built if the regulation already exists.

4 Q. Let meet just focus on the total  
5 utility program costs. That's what my question related  
6 to.

7 Assuming a widget susceptible to  
8 regulation and that a regulation is in fact passed,  
9 would you agree that in most cases the total utility  
10 program costs are less than what they would be without  
11 the regulation?

12 A. Yes, I agree with that.

13 Q. Now, would you agree that if in fact  
14 in the scenario of a provincial regulation being passed  
15 and the total utility program costs therefore being  
16 less in most cases than they otherwise would be, that  
17 it is now likely that electrical efficiency  
18 opportunities which would not have passed the total  
19 customer cost test now do so?

20 MR. SHALABY: A. Some would, yes.

21 I think the testimony of this panel has  
22 been that many options comfortably pass the total  
23 customer cost test. I don't think we have too many  
24 cliff hangers that would come one way or the other  
25 because of a small change in a program test. But

1 conceptually you're right.

2 Q. Thank you.

3 If you could now turn the page to page 3  
4 of Exhibit 310, which is identified as Case 3.

5 Now, I suggest to you again the identical  
6 scenario of Case 2, namely a provincial regulation  
7 applicable to a technology that is susceptible to  
8 regulation. And would you agree that in some cases the  
9 benefit of such a regulation -- or there may be a  
10 benefit of such a regulation accruing to the provincial  
11 government in addition to the benefit accruing to Hydro  
12 in terms terms of avoided cost?

13 A. Your example here is of water  
14 savings?

15 Q. The example on that page is an energy  
16 efficient showerhead, if you think of that example.

17 A. Whether its provincial or municipal  
18 government, I don't know who incurs the water treatment  
19 costs, but yes, there are water treatment and sewage  
20 savings associated with the showerhead program.

21 Q. And assuming that to be the case, if  
22 you can look at the formulae in Case 3, would you agree  
23 that in using that formulae it would be appropriate to  
24 identify on the same side as avoided total system costs  
25 some value attributable to the avoided government

1 costs?

2 A. If you do that then what you are  
3 describing is something approaching avoided societal  
4 costs, for example, total customers of water and  
5 electricity costs. You are enlarging the concept a bit  
6 and capturing more than electricity savings.

7 Q. That's right.

8 A. Your capturing electricity and water  
9 savings.

10 Q. That's right. And would you agree  
11 that in doing so with this formula is true to the  
12 concept of the total customer cost test as used in Case  
13 1, for example?

14 A. It is but what you are doing is you  
15 are enlarging, you are defining the customer not to be  
16 the customer for electricity but a customer for  
17 electricity and water services. And you are measuring  
18 the avoided costs for the services of electricity and  
19 water together. So, it is an extension of the test  
20 from a strictly electricity service cost to something  
21 else added to it.

22 Q. And would you agree that if you used  
23 that formula now including the avoided government cost,  
24 an electrical efficiency opportunity which previously  
25 would not pass that test now might?

1                   A. If he chose to take that perspective  
2 and used that as a criterion for judging programs, then  
3 you're right, yes.

4                   Q. Thank you.

5                   If you could turn to page 4 now, Exhibit  
6 310. Case 4, as you can see, adopts the formula from  
7 Case 3 and adds one other factor. Would you agree that  
8 if a government, whether the provincial government or  
9 another government, mandates a particular electrical  
10 efficiency opportunity, there is likely to be increased  
11 economies of scale in the production of that electrical  
12 opportunity?

13                  A. If he assumed higher penetration,  
14 more product available. I assume my colleagues from  
15 the marketing side would have a comment.

16                  MR. MACLELLAN: A. If you are assuming  
17 that that product is not yet a mature product in the  
18 marketplace, then you are probably right.

19                  Q. And that would apply to many of the  
20 products which we typically examine as electrical  
21 efficiency opportunities; is that correct?

22                  A. Yes, frequently increased quantities  
23 or productions could help in terms of price.

24                  Q. But my question is, in fact that is  
25 characteristic of many of the electrical efficiency



1 opportunities we examined. They are not mature  
2 products; they are relatively new?

3 A. Yes, many of them are new.

4 [10:25 a.m] Q. Now, can you look at the formula  
5 listed under Case 4 there and tell me if I have  
6 correctly incorporated the economies of scale which  
7 would result if an electrical efficiency opportunity  
8 was mandated?

9 In other words, it is likely that the  
10 participant costs would be reduced as compared to what  
11 they otherwise would be; is that correct?

12 MR. SHALABY: A. You applied it  
13 correctly. I'm not going to quibble on whether at the  
14 end you say lower priced showerhead or lower cost  
15 showerhead. Whether the lower costs would be passed to  
16 consumers or not is another matter.

17 Q. All right. Thank you.

18 If I could then ask you to turn to page 5  
19 of Exhibit 310.

20 Would you agree that the increased  
21 penetration of the marketplace by an electrical  
22 efficiency opportunity that is due to a regulation may  
23 well also avoid other environmental costs; and I am  
24 using the example in that Case 5 of an avoided emission  
25 control or avoided emissions, rather.



1                   A. The example you are showing at the  
2 bottom of that page is that your exhibit shows avoided  
3 total system costs, plus avoided water treatment  
4 capacity, plus avoided emission control systems. And  
5 we have gone through some details with panel three to  
6 indicate that avoided emission control systems are in  
7 fact part and parcel of the avoided costs.

8                   So to the extent there is emission  
9 control costs to be avoided, they are part of the  
10 avoided costs that we calculate. So there may be a bit  
11 of double counting in that last equation that you show.

12                  Q. Are there potentially other avoided  
13 environmental costs other than emissions which result  
14 in a higher penetration of an electrical efficiency  
15 opportunity?

16                  A. There would be reduced environmental,  
17 what we call residual emissions; for example, or  
18 impacts, yes.

19                  DR. CONNELL: Mr. Klippenstein, I wonder  
20 if I could just put a question to the panel to clarify  
21 my understanding of the water treatment issue.

22                  This seems to me to be rather  
23 counter-intuitive that further regulatory constraints  
24 would lead to lower cost. I suppose it would be  
25 conceivable, let me put this to you as question, that

1 introduction of a regulation might restrict competition  
2 in the design of a certain widget, could lead to a kind  
3 of quasi monopoly or it might discourage new suppliers  
4 from coming into the market.

5 Have you encountered any phenomena such  
6 as that? On balance, which do you think is more  
7 likely? The reduced price or the increased price?

8 MR. MacLELLAN: Again it depends on the  
9 maturity of the product in the marketplace. In the  
10 case of showerheads that is a fairly easy one to argue,  
11 that there would be no negative impact. There are many  
12 manufacturers in the marketplace; they offer many  
13 different models and the market share of those more  
14 efficient showerheads is quite high.

15 So I do not think you would encounter a  
16 problem where scarcity of supply would force the price  
17 of the product up. So in that case I think the  
18 assumption holds.

19 There are other cases, though. Let us  
20 say the government mandated that the only kind of heat  
21 pumps allowable were dual fuel heat pumps or bivalent  
22 heat pumps that we have talked about before. There's  
23 really only one manufacturer of those. He has a pretty  
24 tight patent on the product it seems and that's a case  
25 where they would not be available, there would be a

1 real scarcity of supply, you would have a quasi  
2 monopolistic situation as you say. So you have to look  
3 at it product by product.

4 Some cases where it is quite a mature  
5 product it can work. There are a lot of other cases  
6 where there would be some real risks.

7 MR. KLIPPENSTEIN: Q. If I can  
8 follow-up on that, Mr. MacLellan.

9 Presumably a regulation would not specify  
10 a particular product made by a particular manufacturer.  
11 Would you agree?

12 MR. MACLELLAN: A. No, but it would  
13 probably specify a technology.

14 Q. Would you agree that it is unlikely  
15 that a regulation would specify a technology that is --  
16 a specific technology that is patented?

17 A. We hope not but that would be  
18 ignoring some real potential as well.

19 Q. Would you agree that if a regulation  
20 did not specify a particular patented technology the  
21 field remains wide open for anybody who is able or  
22 willing to enter the market to come up with some other  
23 product that will meet that regulation?

24 A. It remains wide open, but that does  
25 not mean it is easy to do.

1                   There are reports around that say that  
2           there is likely to be a two year shortage of compact  
3           flourescents, for example. This is world wide  
4           shortage. So it is not like a lot of these things have  
5           easy entry into the marketplace. So that is why  
6           regulations have to consider the pace at which  
7           manufacturers can adhere to the regulations.

8                   But, yes, I hope that any regulatory body  
9           would take that into account.

10                   Q. And therefore the normal market  
11           forces would still be applicable to such a regulated  
12           efficiency opportunity?

13                   A. Yes, and sometimes consideration of  
14           those normal market forces actually hurt the efficiency  
15           effort.

16                   The example is the fact that the U.S.  
17           Department of Energy is instituting a number of  
18           efficiency regulations for appliances January 1st,  
19           1993. The Ontario government has decided to let  
20           Ontario manufacturers have a full year in order to  
21           catch up and change their assembly line and retool in  
22           order to achieve.

23                   That is a case where for a year there is  
24           a possibility of Ontario having far less efficient  
25           product available than is available across the border.

1 So again another thing to keep in mind when you are  
2 talking about free market forces.

3 Q. But in that case there will be a  
4 number of manufacturers producing the product that  
5 there will be no monopoly. There will in fact be  
6 competition, is that right?

7 A. Yes. Maybe not in Canada, will they  
8 be producing, but there will be a number producing.

9 Q. Thank you.

10 MR. BURKE: A. I think there is another  
11 issue related to -- and it really depends on the  
12 context in which you are talking here.

13 But if standards replaced programs  
14 completely there are a lot of positive effects of  
15 programs to push the frontiers of efficiency gain  
16 beyond the said levels of standards that would perhaps  
17 mean that if the only force for efficiency improvement  
18 were regulations, that the full efficiency gain and the  
19 market forces at work to exceed the regulated levels  
20 would be curtailed. And so you would have to somehow  
21 maintain an environment in which producers had an  
22 incentive to continue to improve efficiency beyond the  
23 regulated standards.

24 Q. Just to make it clear, my questions  
25 do not in any way detract from that possibility, and am



1 I correct in thinking that if I allow the possibility  
2 of continuing programs that exceed the regulations we  
3 are discussing here, that would not affect the  
4 scenarios which I have just propose to the panel. Am I  
5 correct?

6 A. I think it is something you have to  
7 design carefully, but all I am trying to indicate is  
8 that that is an issue to be carefully considered in the  
9 course of moving to higher amounts of regulation in the  
10 marketplace.

11 Q. I do not dispute that, but my  
12 question is: These programs that you speak of do not  
13 affect the formulas that I have just worked through?

14 A. No, they do not affect the formulas.

15 Q. Thank you.

16 Now, if I could ask to you turn to page 6  
17 of Exhibit 310.

18 Would you agree that the total customer  
19 cost tests can be thought of as a line that separates  
20 the economic electrical efficiency opportunities from  
21 the non economic electrical efficiency opportunities  
22 and that I can draw that as a circle to encompass the  
23 cases which pass.

24 Does that make sense to you, as I have  
25 done in page 6.



1 MR. SHALABY: A. I think the illustration  
2 serves to show how the different cases stack up. I do  
3 not want to get into what is economic and the lines.

4 [10:36 a.m.] All of that is treacherous territory  
5 first thing Monday morning, as the Chairman said. I  
6 think your diagram shows the relationship of the cases  
7 one to another. I accept that.

8 Q. Okay. Would you agree that --

9 A. We called it the onion diagram.

10 Q. The onion diagram. I hope it doesn't  
11 cause us to weep this morning. (Laughter)

12 Now, Mr. Shalaby, I think when I put Case  
13 2 to you, you agreed that some electrical efficiency  
14 opportunities would pass under the formula on Case 2  
15 when they wouldn't under Case 1.

16 A. Yes.

17 Q. Yes. Now, would you agree that that  
18 can be represented by moving the circle representing  
19 Case 1 on page 6 to the circle representing Case 2, as  
20 if you would, there is now a wider field of electrical  
21 efficiency opportunities which may pass the total  
22 customer cost test?

23 A. Yes.

24 MR. B. CAMPBELL: Mr. Chairman, just  
25 before my friend goes too far down this, I would point

1 out that Mr. Shalaby's evidence was that conceptually,  
2 that was correct, but I do recall him specifically  
3 saying that, in fact, there were not many technologies  
4 on that kind of margin. I don't want that overlooked  
5 in my friend's question.

6 MR. SHALABY: This gets us into whether  
7 this is to scale or not. That is yet another --  
8 conceptually, what you are saying is conceptually  
9 correct.

10 MR. KLIPPENSTEIN: Q. Okay. It is  
11 conceptually correct, but we don't know how many or  
12 indeed whether there are any electrical efficiency  
13 opportunities which fit within that expansion from Case  
14 1 to Case 2; is that correct?

15 MR. SHALABY: A. Yes. That is another  
16 matter to go into the details. I think what my point  
17 was, there aren't that many that are border cases that  
18 need yet another little bit to come in. But I am  
19 agreeing with you on a conceptual basis that that is  
20 correct, yes.

21 Q. And, in fact, in order to determine  
22 whether -- well, let me rephrase my question. Do you  
23 know how many would fit within that expansion?

24 A. Well, I think if we go back to  
25 exhibits that showed the supply curves that were

1 presented in Exhibit 76, for example, that would be a  
2 good indication of what options are at the margin and  
3 could benefit from a slight improvement in the total  
4 customer cost test.

5 In fact, we found it difficult to find  
6 examples of things that didn't pass the total customer  
7 cost test and there are only few things that don't.

8 Q. In fact, the way to determine whether  
9 there are any that would pass the total customer cost  
10 test under Case 2 which did not under Case 1 would be  
11 to run the calculations again but this time reducing  
12 the total utility program cost; is that correct?

13 A. Yes.

14 Q. Have those calculations been done?

15 A. Not to my knowledge, not in that  
16 format.

17 Q. So, in fact, if you applied the  
18 formula as in Case 2, you might discover there is other  
19 electrical efficiency opportunities which you have not  
20 included so far; is that correct?

21 A. Maybe you could refer to Mr. Burke.

22 MR. BURKE: A. What we have done is do  
23 both sides of the test; that is, we do have the tests  
24 done from the perspective of avoided total system  
25 costs. We have that number and we have the sum of

1 total utility program costs plus participant costs.

2 So that I can suggest to you that there  
3 are very few options where the difference is large  
4 either way; that is, it is not like we have not even  
5 screened some measures because we thought they would be  
6 too expensive before we did so. That seemed to be the  
7 implication, that we wouldn't know whether something  
8 was cheaper now under this new approach because we  
9 hadn't even considered it in the first place.

10 We have screened all the measures that we  
11 are aware of in this broad cost area and I think it is  
12 fair to say we would know whether or not there are some  
13 that are within the margin represented by the total  
14 utility program costs and there are very few.

15 Q. Can you list them?

16 A. Well, I can give you some examples.

17 Q. Would you?

18 A. As we have discussed at various  
19 points, there are various applications of T8 lamps that  
20 become economic or are currently uneconomic and could  
21 conceivably pass.

22 Q. You said "could conceivably pass". I  
23 guess my question is whether they would pass in a Case  
24 2 formula?

25 A. Well, it depends how much the total

1 utility program costs are. And that information I  
2 don't have specific to each program, but generically,  
3 we are talking \$350 a kilowatt in the commercial  
4 sector.

5 Perhaps the best way to do this would be  
6 if I produce some examples later on. I think to  
7 produce a comprehensive list of all those things on a  
8 border line would be difficult in some cases because  
9 the technologies have been evaluated for specific  
10 applications and we couldn't redo those so well.

11 But in a commercial sector, I think, and  
12 in the residential sector, I should be able to give you  
13 some examples of options that were screened out and  
14 probably where the margin is of the order of the total  
15 utility program costs.

16 Q. I think that is important and I would  
17 appreciate getting that, those examples, If I may.

18 MR. B. CAMPBELL: Do you need an  
19 undertaking number for this then?

20 THE REGISTRAR: 261.57, Mr. Chairman.

21 MR. B. CAMPBELL: I think it is not an  
22 interrogatory number. It would be an undertaking  
23 number. And our records at least show it should be  
24 267.14.

25 THE REGISTRAR: That is correct.



1       ---UNDERTAKING NO. 267.14: Ontario Hydro undertakes to  
2                               provide a list of examples of modified  
3                               application which meet the total customer  
4                               cost test.

5                       MR. D. POCH: Mr. Chairman, I hesitate to  
6                       interrupt my friend's cross. I had thought during my  
7                       cross-examination that there were a number of examples  
8                       developed which were of a different type, which were of  
9                       the same technology but in greater application.

10                      It might be cost effective to put in a  
11                      second compact fluorescent light bulb or a third or a  
12                      fourth or eight, as we saw some utilities doing,  
13                      depending on where avoided cost gets.

14                      And I am wondering if I could impose, to  
15                      avoid any need to come back and ask to re-cross, if  
16                      that undertaking could simply be expanded to include  
17                      Hydro's provision of their view of the cost effective  
18                      potential for efficiency; the extension of that curve,  
19                      if you will, to capture both more as well as different  
20                      kinds of technology as avoided cost changes, then I  
21                      think that would be clear and I wouldn't need to come  
22                      back and clarify that yet again. I don't know if that  
23                      is clear, Mr. Burke.

24                      MR. BURKE: I don't understand what you  
25                      are getting at, I have to say, and really, all I am  
                      proposing -- offering to do, because we have done a



1 large number of total customer cost tests' results and  
2 there are some that didn't pass, I was going to provide  
3 what those were, and that is as far as I think I can  
4 reasonably go.

5 MR. D. POCH: Just to clarify and then I  
6 will leave it with the Board, I thought it was clear,  
7 apparently not, to some, that there are situations  
8 where a technology which is deemed cost effective is  
9 not cost effective. And Hydro's witnesses told us  
10 about the second or the fifth, whatever, compact  
11 fluorescent in a residence might not be cost effective  
12 because that light bulb wouldn't be on enough in a  
13 given day.

14 And if Mr. Burke is undertaking to extend  
15 his analysis of what is out there that might be cost  
16 effective if avoided cost went up, I would assume  
17 there's two categories: There's new technologies or  
18 technologies that they haven't already captured and  
19 there is greater application of the technologies they  
20 are grappling with because there will be more  
21 situations where the application of this technology  
22 becomes cost effective.

23 THE CHAIRMAN: I thought the current  
24 discussion was confined to those items which had failed  
25 the total customer cost test because of the magnitude

1 of the program costs and that what would be the effect  
2 of a reduction in program costs because of the  
3 introduction of standards in making further technology  
4 eligible.

5 I didn't take the question went any  
6 farther than that and, of course, as nobody knows, you  
7 have got to know, I would think, have to know a) what  
8 the standard is and how far the standard goes and then  
9 make some estimate about the program costs. That would  
10 be rather a speculative venture right at this  
11 particular time, other than the ones that have already  
12 been captured in the overall analysis.

13 So, I would think that all Mr. Burke was  
14 saying was that he would give the technologies that  
15 were close to that.

16 MR. D. POCH: Thank you, Mr. Chairman. I  
17 had obviously taken Mr. Klippenstein's request as  
18 broader than that, as sort of extending the cost curve.

19 THE CHAIRMAN: If it was, I may have  
20 misunderstood him. I thought it went no farther than  
21 that.

22 MS. FRASER: Yes. Not to restate Mr.  
23 Burke's evidence, but I think applications are included  
24 in your list, like the T8s and religious buildings is  
25 an application issue as opposed to a technology issue.

1 MR. BURKE: I will provide the examples I  
2 have. That is what I was offering. I am really not  
3 trying to create an open-ended question here which is,  
4 I think, what Mr. Poch was creating.

5 We have done a fair number of total  
6 customer costs tests on technologies. And to the  
7 extent that we have results and they do not pass, I  
8 will give you them and by how much they did not pass  
9 and if that is satisfactory...

10 MR. KLIPPENSTEIN: I appreciate that and  
11 I think you have correctly understood my question.

12 I do appreciate a list of examples, but  
13 my question, I would hope, would not result in a bunch  
14 of numbers that I can crunch at home one evening.

15 Q. I just want to make sure that I am  
16 correct in understanding that if you run the total  
17 customer cost test with the assumption of provincial  
18 regulations, this time substituting a new realistic  
19 estimate of total utility program costs, we now would  
20 have technologies that passed. I have got that right?

21 MR. BURKE: A. I don't think there would  
22 be any cases where new technologies would pass. It  
23 would be cases where applications of the technology in  
24 areas where it was previously uneconomic might become  
25 economic.

1 I mean, I don't make any guarantees until  
2 I look at the numbers that there is even any examples  
3 that fall into that category; but nonetheless, we have  
4 screened a range of technologies and now I can give you  
5 results where they were not economic.

6 Is it fine if I just restrict the  
7 examples to areas where standards might be applied as  
8 in, for instance, Exhibit 258, we gave the list of  
9 technologies where standards were potentially  
10 applicable and just looked at those particular ones?

11 Q. Definitely. The question only  
12 applies to technologies which are amenable to  
13 standards.

14 A. Okay, fine, good.

15 MR. B. CAMPBELL: There was one little  
16 catch in what Mr. Klippenstein said that I am going to  
17 put on the record right now. We will have to make, I  
18 assume, Mr. Burke, in responding to that undertaking  
19 some assumptions about the potential reduction in  
20 program costs. They will be pure and simple  
21 assumptions.

22 As the testimony has already stated,  
23 there is a potential for a regulation to have a very,  
24 very -- it could range from nothing to a significant  
25 impact on program costs. That is the evidence and we

1 will have to make some assumption about that. I think  
2 all we can reasonably be asked to do in that case is be  
3 clear about the assumption we are making in that  
4 respect and I will ensure that that is done.

5 THE CHAIRMAN: Well, the assumption that  
6 Mr. Klippenstein put in was that program costs are  
7 reduced to zero. Now, the evidence is that that may  
8 not necessarily follow, but I suppose if you had made  
9 that assumption, then you would get all the possible  
10 ones that might fall into that, then they could work on  
11 it from there.

12 MR. B. CAMPBELL: I have no difficulty  
13 with that. I just want to be clear that when the  
14 answer comes back, it is going to have to address that  
15 point quite specifically so that we all know what we  
16 are working from

17 THE CHAIRMAN: It is clear the evidence  
18 is that nobody knows what it will be, but it will  
19 certainly be no less than zero. (Laughter)

20 MR. B. CAMPBELL: I think that is safe.

21 MR. KLIPPENSTEIN: Thank you, Mr.  
22 Chairman.

23 Q. I am not asking for an unrealistic  
24 example. And if the answer is not zero, then don't use  
25 zero.



1                   The answer that I understand I received  
2           was that the total utility program cost would, in fact,  
3           be less in most cases and all I ask is realistic  
4           assumptions.

5           [10:50 a.m.] MR. B. CAMPBELL: I mean, Mr. Chairman --

6                   THE CHAIRMAN: I think it's understood  
7           that nobody knows or can even guess or make any kind of  
8           intelligent estimate of what the reduction would be  
9           when you don't know what the standards are, you don't  
10          know how far they go and so on. So, it will have to be  
11          recognized as an assumption, whatever one they want to  
12          put in.

13                   I would suggest it should be zero and  
14          then that gives Mr. Klippenstein a full range of  
15          possibilities; he can do what he likes with it when he  
16          comes to put in his case.

17                   MR. KLIPPENSTEIN: Q. Now, if I could  
18          ask the panel again to look at page 6 of Exhibit 310,  
19          the diagram. The members of the panel have, as I  
20          understood, agreed that in Case 2, the circle  
21          representing Case 2 would in fact conceptually be  
22          outside of Case 1. And that Case 3, the circle would  
23          conceptually be outside of Case 2 or at least outside  
24          of Case 1. With respect to Case 4, that there would at  
25          least in many cases be applicable economies of scale.

1 Am I correct in concluding that if you  
2 ran the total customer cost test with the modifications  
3 listed in these cases, there is likely to be at least  
4 some technologies which now pass which didn't before?

5 MR. SHALABY: A. Yes.

6 Q. Did I understand correctly that that  
7 was a "yes"?

8 A. Yes.

9 Q. Could I then ask you to turn to --

10 A. -- of our discussions, of course.

11 Q. Could I then ask you to turn to  
12 Exhibit 258, page 6, Table 4.

13 A. I am wondering whether we have five  
14 cases because we just finished five months of hearing  
15 or is that a coincidence?

16 Q. Exactly, yes.

17 A. Today is the fifth month.

18 Q. Now, on Table 4, the column entitled  
19 EEI potential before FS, in other words, the electrical  
20 efficiency improvement opportunities potential before  
21 Fuel Switching for all sectors total 6,380 megawatts, I  
22 believe. Would you agree that if you ran the total  
23 customer cost test with the modifications suggested in  
24 the various cases, that number is likely to be too low?

25 MR. BURKE: A. Well, just a point that

1 needs to be clarified. The numbers as they stand in  
2 this exhibit are consistent about Exhibit 76, and as we  
3 pointed out at various points, the values for potential  
4 in Exhibit 76 did not net out the effect of the  
5 standards that were already captured by the 1990 load  
6 forecast. So the standards that are currently either  
7 on the books or fully anticipated to come into effect  
8 by 1994, including the refrigerator standard, are  
9 already captured in the 1990 load forecast and reduce  
10 that 6,380 number to about 6,200. Given that, there  
11 would be some increase -- Wait a minute, to potential?

12 Q. Yes.

13 A. There wouldn't be any change to  
14 potential at all.

15 Q. Now, if you run the total customer  
16 cost test --

17 A. I'm sorry, the total customer cost,  
18 yes. Possibly a small amount.

19 Q. Thank you, Mr. Burke. A small  
20 increase possibly?

21 A. Yes.

22 MS. FRASER: A. As Mr. Shalaby pointed  
23 out, by the time you get down to six you are not  
24 talking about the total customer cost test from the  
25 perspective of total electricity customers anymore.

1 Q. That's right. Would you agree that  
2 it is perfectly rational for the provincial government  
3 to apply the tests as we have outlined them in Cases 2  
4 to 5?

5 A. You can apply this sort of test using  
6 any sorts of perspectives that you wish.

7 Q. But would you agree that it would be  
8 reasonable for the provincial government in forming its  
9 regulations to apply the tests as we have set them out  
10 in Cases 2 to 5?

11 A. That would be an issue for government  
12 policy. I'm not sure how they go about doing it now.  
13 Similar kinds of cost benefit analysis are done.

14 Q. You, members of the panel, have  
15 stated in the past that Ontario Hydro is willing to  
16 assist in promoting and developing aggressive standards  
17 for electrical efficiency opportunities. I assume  
18 that's correct?

19 A. Yes, it is.

20 Q. And it would be appropriate then for  
21 Hydro to assist the provincial government in running  
22 tests, as you and I have just discussed, to determine  
23 what the effect of running Cases 2 to 5 would be; in  
24 other words, to do those calculations for the  
25 provincial government.

1 MR. SHALABY: A. We do not have all the  
2 information to run those tests.

3 Q. But you would likely have some of it?

4 A. Some we might, yes.

5 Q. And to the extent you have the  
6 information, it would be in line with Hydro's policies  
7 to assist the government to run through these tests as  
8 in Cases 2 to 5 to determine what electrical efficiency  
9 opportunities now would pass; is that right?

10 MR. WILSON: A. I think the simplest  
11 thing to say about the questions you are asking here is  
12 that we are prepared to do any number of things to  
13 assist the provincial government. They may not want us  
14 to do this, but it would seem reasonable to me that we  
15 would offer information we have. If they are going to  
16 accept that assistance, we would likely offer it, and  
17 to the extent that we are be available to provide it,  
18 it would be helpful.

19 Q. To pick an example, I think Mr. Burke  
20 has agreed that using some of the total customer cost  
21 tests as set out in Exhibit 310 might result in an  
22 increase in potential EEI.

23 Would it not be reasonable for Hydro to  
24 run the Case 2 formula, supply that information to the  
25 provincial government so the provincial government can



1 identify which new electrical efficiency opportunities  
2 might now be beneficially regulated; is that  
3 reasonable?

4 A. I expect that we will work with the  
5 provincial government to identify the areas, from our  
6 perspective at least, that regulation would be suitable  
7 for it. There are a lot of different perspectives on  
8 what should be regulated, and we will have one view.

9 MR. BURKE: A. I should clarify, I don't  
10 think we are going to identify new technologies. We  
11 are only going to identify applications of the  
12 technologies that were previously uneconomic that  
13 become economic.

14 Q. I'm sorry, thank you for that  
15 correction. I believe the fact that the potential EEI  
16 may be increased is not affected by that correction.

17 A. Yes.

18 MR. MacLELLAN: A. We are also working  
19 with the provincial government now on regulations. We  
20 are not using a formula per se, but we are having  
21 indepth discussions about appropriate levels of the  
22 plant's efficiency, for example, based on our knowledge  
23 of the market, and to some extent our avoided costs,  
24 and their knowledge of the market and their costs. So  
25 that discussion is going on now and has been going on

1 for years. We just aren't using a formula.

2 Q. Has Hydro said to the provincial  
3 government, "We have run the Case 2 formula, if you  
4 pass a regulation, these are now appropriate, these  
5 applications are now appropriate for regulations." Has  
6 that happened? I presume from our discussions it  
7 hasn't?

8 A. Not in the case of appliances, not in  
9 that way, no.

10 MR. BURKE: A. I think the major reason  
11 is that what we are talking about is not a significant  
12 effect and really won't make much difference, and that  
13 would be clear from the examples. But it is not a  
14 significant issue because of the shape of the load  
15 reduction curves for each of the segments, and in  
16 particular where regulations are applicable.

17 Q. Would it not be possible for Ontario  
18 Hydro to discuss with the provincial government Case 3,  
19 which is page 3 of the Exhibit 310?

20 MS. FRASER: A. Well, we have discussed  
21 your particular example with the government in terms of  
22 the showerhead program, the Ministry of Environment in  
23 terms of discussions, and they are pursuing aggressive  
24 promotion of energy efficient showerheads as well  
25 through an information campaign.

1 MR. MacLELLAN: A. We are also

2 discussing the idea of regulating the flow rate of  
3 showerheads with the group that does the plumbing code,  
4 for example. We have had a number of conversations  
5 with them on that. So yes, we are talking about this.

6 Q. Thank you.

7 Am I correct in understanding - and  
8 leaving the total customer cost test now - that the  
9 Demand/Supply Plan, including all the updates to this  
10 date, assume that there will be no further energy  
11 efficiency regulations other than the regulations  
12 specifically mentioned in the material so far?

13 MR. BURKE: A. Well, for the basic load  
14 forecast the regulations have been laid out that we  
15 have assumed, and then in Exhibit 258 we hypothesized  
16 in some of these scenarios additional standards which  
17 were not specific to particular products or  
18 technologies but which had the effect of increasing the  
19 penetration rate to 100 per cent for some market  
20 segments. So that impact is captured in Exhibit 258  
21 and there are two cases of 50 per cent standards and  
22 100 per cent standards referring to whether the  
23 measures went to 50 per cent of the maximum economic  
24 efficiency gain or the full hundred per cent.

25 Q. Am I correct in understanding, the

1 latest energy efficient regulation which is factored  
2 into the plan as it now stands is somewhere around  
3 1994/1995; is that correct?

4 A. The latest one is the 1994  
5 refrigerator alignment with the U.S. 1993 standard.

6 Q. And so this plan assumes that there  
7 will be no further electrical efficiency regulations  
8 after 1994?

9 MR. B. CAMPBELL: Isn't that the same  
10 question that was just asked? Mr. Burke has exactly  
11 explained that that is correct for the basic load  
12 forecast, but is not true for the scenarios that have  
13 been put forward in Exhibit 258. Haven't we just dealt  
14 with that?

15 MR. KLIPPENSTEIN: My understanding is  
16 that we haven't.

17 MR. B. CAMPBELL: It sounded to me like  
18 the identical question.

19 THE CHAIRMAN: Perhaps to clarify, we can  
20 straighten it out.

21 MR. BURKE: Exhibit 258 contains the  
22 assumption that standards come in in 1995, at either of  
23 two levels for the residential sector and the  
24 commercial sector, and so those scenarios include a  
25 significant increase in the amount of regulation of

1 product performance.

2 MR. KLIPPENSTEIN: Q. Thank you for  
3 correcting me on that date.

4 My question now is, the Demand/Supply  
5 Plan, the basic load forecast also Exhibit 258, all  
6 assume there will be no new energy efficiency  
7 regulations after 1995. Am I understanding that  
8 correctly? After the ones listed in Exhibit 258, which  
9 are to be in place by 1995; is that right?

10 MR. BURKE: A. I see what you are  
11 saying. Assuming full implmentation in 1995, have we  
12 said anything about beyond 1995?

13 Q. That's correct.

14 A. No. But in the case where we have a  
15 hundred per cent efficiency, the standard is set at the  
16 maximum economic efficiency level for that end use.  
17 There are no remaining stardards that could be set that  
18 we believe -- that will have exhausted the  
19 opportunities we can identify today for standards, if  
20 we go to that full 100 per cent level, which I think  
21 does not happen in Case C but happens in Case D.

22 Q. Would you not agree that electrical  
23 efficiency is likely to undergo a natural improvement  
24 over this period to 1995 and including beyond 1995 for  
25 the rest of the plan period?



1 [11:07 a.m.] A. Yes, and that's imbedded in the basic  
2 load forecast.

3 Q. But nowhere here has Hydro assumed or  
4 allowed for any new electrical efficiency regulations  
5 which may take place after 1995?

6 A. Well, this may be getting into a  
7 point that we have discussed several times, which is  
8 the extent to which one can project technology change.  
9 And our approach has been not to project technology  
10 change and to essentially view the amount that is in an  
11 increment to the natural and the basic load forecast as  
12 what we can estimate today with a snapshot approach to  
13 technology as it exists today, assuming that the  
14 technologies that are in the basic load forecast will  
15 evolve just as the ones which we might have to induce  
16 or apply standards to would evolve, but the magnitude  
17 of the impact is best estimated as we have done using  
18 information that is known today.

19 So that projection beyond 1995, that is,  
20 as I understand what you are question is implying, that  
21 there is a potential for greater impact from standards  
22 because there would be new efficiency technologies that  
23 could be regulated.

24 That is the point that we do not agree  
25 with. We essentially feel that if there are new

1 technologies, that that will apply both to what can be  
2 induced to regulated and what will occur naturally and  
3 that the net, which is what we are estimating here for  
4 the potential induced, is best estimated again as we  
5 have done.

6 Q. I am not sure I understand your  
7 answer, Mr. Burke. I will just repeat my question  
8 again and I may not be understanding things.

9 Am I correct that this plan, including  
10 all the documents, including Exhibit 258, assume that  
11 there will be no new electrical efficiency regulations  
12 after the ones passed in exhibit -- or the ones listed  
13 in Exhibit 258 are passed in 1995?

14 A. Well, my answer was that in Case D,  
15 which is a case that moves to a hundred... The answer  
16 is, yes, there will be no new ones and the reason for  
17 it is there is no potential for new ones in terms of  
18 having load impact.

19 It is conceivable that there may be new  
20 regulations passed, but what we are saying is that the  
21 impact in terms of load, we believe is best estimated  
22 the way we have already estimated them in Case D, for  
23 the hundred per cent standards case. And I think there  
24 is further explanation or rationale for that in the  
25 direct evidence that I gave.

1 THE CHAIRMAN: Let me make sure I  
2 understand. Maybe I will confuse it.

3 You take what you see today and use that  
4 as your basis because some of those may develop and  
5 some will not, and so you think that their best way of  
6 judging it is to take what you see today and work on  
7 that knowing that there will be some pluses and minuses  
8 down the road. Is that a --

9 MR. BURKE: Well, if the pluses and  
10 minuses refer to the induced EEI, yes. That is, we  
11 assume that there will be evolution in technology which  
12 will make efficiency improvement technology cheaper  
13 through time so that some things that we consider  
14 requiring inducement today will not require inducement  
15 in practice 10 years from now.

16 It may very well be that T8s will be  
17 extremely cheap 10 years from now and everybody will  
18 install them without an incentive, but it is also the  
19 case that there will probably be some new lighting  
20 technology available 10 years from now which is quite  
21 expensive, which is not naturally taken up by the  
22 market at that point in time, which we could be  
23 inducing at that point in time.

24 So for the purposes of estimating that  
25 net impact of our programs or standards, if that was

1 the rout we were going, the effect, we feel, is best  
2 captured by this difference between what we can observe  
3 today as the maximum economic technology to induce and  
4 that which will occur naturally. And the assumption  
5 underlying that is that simply that the rate of  
6 technological change will affect both of these ends of  
7 the spectrum at the same rate.

8                   Until we have some evidence to say that  
9 natural technologies will evolve faster or slower than  
10 the maximum economic technologies, this is the best  
11 assumption to make.

12                   At some point in the future we may feel  
13 that technology is evolving extremely rapidly at the  
14 expensive end of the range and we might want to change  
15 our perspective. But at this point in time we have no  
16 basis for that, so we are assuming that both the  
17 technology -- that electrical efficiency improvements  
18 become essentially more cost effective at equal rates  
19 through the spectrum of technologies.

20                   MR. KLIPPENSTEIN: Q. I did not  
21 understand your answer, but let me just make sure I do  
22 understand one thing.

23                   One of your assumptions is that no  
24 government, 6 or 8 or 10 years from now, will pass new,  
25 more aggressive energy efficiency regulations. Am I

1 correct?

2 MR. BURKE: A. I'm not ruling that out.

3 What I am suggesting is, that should they do so it  
4 would be my contention at this point that the net  
5 impact on load would not necessarily be to reduce the  
6 basic load forecast any more than we already have.

7 That is the general efficiency level may  
8 be higher, but also the natural efficiency level could  
9 also be higher, effectively. And there could be other  
10 changes as we have argued to the basic load forecast  
11 which could offset these changes in natural efficiency  
12 improvement.

13 Q. So you are saying that if a  
14 government 6 or 8 or 10 years from now were to pass  
15 new, more aggressive energy efficiency regulations they  
16 would not make a difference for this forecast?

17 A. Yes, that is the point.

18 From the point of view of the primary  
19 load forecast, that what you are saying it could be  
20 more aggressive standards. That could happen, but it  
21 would still not necessarily change the primary load  
22 forecast.

23 MS. PATTERSON: I thought, Mr. Burke,  
24 that you said the basic load forecast before and now  
25 you are saying the primary load forecast. Do you mean



1 both?

2 MR. BURKE: No. Well, if I said the  
3 basic before, it is the primary that matters in this  
4 sense.

5 The natural efficiency improvement that  
6 is imbedded in the basic load forecast, we could be  
7 effectively understating that through technical change  
8 that we have not fully anticipated. And as we said for  
9 Panel 1, it is also possible that the effective  
10 technological change could be to increase the use of  
11 electricity in some applications that we have not fully  
12 anticipated.

13 So from the point of view of the basic  
14 load forecasts, we have assumed those two forces  
15 offset. There are risks on either side and we can't do  
16 any better than to assume that they are offsetting on  
17 that. And from the point of view purely of efficiency,  
18 however, that the effective technology change at the  
19 upper end of the spectrum, the cost spectrum, that  
20 there will be new technologies coming along that will  
21 make the level of efficiency that can be induced higher  
22 perhaps, and that that will probably come hand in hand  
23 with the evolution of technologies in terms of lower  
24 cost that will make the amount of natural efficiency  
25 gain higher. And again we have assumed that those

1 balance out over time.

2 Really what it comes to is that this is  
3 an area of forecasting technological change and in the  
4 absence of being able to specify what those changes  
5 will be, we have assumed -- had to make some  
6 simplifying assumptions about the symmetry of the way  
7 technology advances.

8 MR. KLIPPENSTEIN: I have no further  
9 questions, Mr. Chairman. That concludes my  
10 cross-examination.

11 [11:16 a.m.] THE CHAIRMAN: Thank you, Mr.  
12 Klippenstein.

13 Mr. Mondrow, are you next?

14 MR. MONDROW: Yes, I am, Mr. Chairman.  
15 Perhaps it would be appropriate to take a break.

16 THE CHAIRMAN: Why don't we take a break  
17 and you can get organized and then we will start in 15  
18 minutes.

19 THE REGISTRAR: This hearing will take a  
20 15-minute recess.

21 ---Recess at 11:17 a.m.

22 ---On resuming at 11:37 a.m..

23 THE REGISTRAR: Please come to order.  
24 The hearing is now in session. Please be seated.

25 THE CHAIRMAN: Mr. Mondrow?

1 MR. MONDROW: Thank you, Mr. Chairman.

2 Good morning, panel. Mr. Shepherd has given me the  
3 opportunity to undertake this cross-examination today,  
4 but I didn't want to leave him out altogether so he has  
5 got some overheads which I prepared and there are  
6 additional copies on the table behind my left shoulder  
7 here.

8 And I believe that the witnesses and the  
9 Board have been provided with a package. Perhaps we  
10 could give the first package which has the precis on it  
11 a new exhibit number, Mr. Chairman.

12 THE REGISTRAR: That will be No. 311, Mr.  
13 Chairman.

14 THE CHAIRMAN: Thank you.

15 ---EXHIBIT NO. 311: Precis Package.

16 MR. MONDROW: And there is a second new  
17 exhibit which is a one-page photocopy of a small item  
18 from the Globe and Mail this past Saturday day and that  
19 would be then Exhibit No. 312.

20 THE REGISTRAR: 312.

21 ---EXHIBIT NO. 312: One-page photocopy of small item  
22 from Globe and Mail.

23 MR. MONDROW: In addition to these two  
24 items, I have, for convenience, provided the Board with  
25 photocopies of the interrogatories that I will be

1 referring to and they can be given their exhibit  
2 numbers as they come up. There are copies of this  
3 package as well on the table behind my left shoulder.

4 And as well, I provided Ms. Morrison and  
5 Ontario Hydro with the numbers for the transcripts and  
6 exhibits that I will likely be referring to so that  
7 these will be handy.

8 And with me this morning, I have Mr.  
9 Steven Diener who is principal of Steven G. Diener and  
10 Associates and the research director for IPPSO's  
11 intervention team.

12 I don't anticipate being too long today,  
13 Mr. Chairman, but IPPSO does consider demand management  
14 an important component of Ontario's electricity future  
15 forming as it does one half of a demand management  
16 non-utility generation package option that, in our  
17 view, presents an environmentally and strategically  
18 preferable alternative to major new supply.

19 So there are a number of issues that I  
20 will be addressing. I will certainly be finished  
21 before the afternoon break, if I can manage, and at the  
22 afternoon break if not earlier than that.

23 To start off -- I am sorry, I should make  
24 one correction. New Exhibit No. 311, if you would  
25 please turn to page 2, at the bottom of that page,

1 opposite the line labelled "TCC test", the word "pass"  
2 is there and that word should be "fail", just to have  
3 that on the record. And I will take that up again in a  
4 minute.

5 CROSS-EXAMINATION BY MR. MONDROW:

6 Q. I would like to start with a  
7 transcript reference. Mr. Shalaby, I believe this was  
8 you and there is no need to turn it up. It was at  
9 Volume 1 for the record -- sorry, Volume 51, page 9229.

10 And Mr. Shalaby, you said that Ontario  
11 Hydro, of course, doesn't have an infinite amount of  
12 resources for demand management or anything else.

13 I assume that that statement indicates  
14 that to some extent, resources are a constraint on  
15 demand management that you can get, how fast you can  
16 get it and how many programs you can put out into the  
17 field at any given time; is that correct?

18 MR. SHALABY: A. Yes.

19 Q. Ms. Fraser, energy management has  
20 very recently received a \$2.7 billion resource  
21 allocation; is that right?

22 MS. FRASER: A. If you mean the movement  
23 of three to six, that money has not been allocated.  
24 Right now it is a projection of what achieving 5200  
25 megawatts of savings will cost. The allocation process



1 takes place in business planning and that process.

2 THE CHAIRMAN: And that is up to the year  
3 2000, is it?

4 MS. FRASER: Yes. That is the current  
5 estimate.

6 MR. MONDROW: Q. I will refer you to  
7 Exhibit 270 which was the exhibit filed by the  
8 Coalition.

9 At page 184, there is a photocopy of an  
10 article from the Globe and Mail dated August --

11 MR. B. CAMPBELL: Just a minute, Exhibit  
12 270?

13 MR. MONDROW: That's right, page no. 184.

14 MR. B. CAMPBELL: I am not sure the panel  
15 has this at the moment.

16 MR. MONDROW: Perhaps, I am not sure  
17 there is a need --

18 THE CHAIRMAN: If you are referring to an  
19 article in the Globe and Mail, perhaps you can just  
20 refer to the pertinent parts of it.

21 MR. MONDROW: Yes. I am not sure there  
22 is a need to turn it up, Mr. Chairman. I will just  
23 read the line that I am thinking of. The author says  
24 that:

25 "Hydro has increased its budget for

1 conservation spending between now and the  
2 year 2000 to 6 billion from 3.3 billion."

3 This article also talks about a  
4 conversation with Mr. Eliesen, Ontario Hydro's Chair.

5 So I assume that this additional money  
6 has perhaps not been allocated to specific programs,  
7 but the Energy Management Branch knows that the money  
8 is going to be there; is that right, Ms. Fraser. You  
9 are expecting this additional money?

10 MS. FRASER: A. That's correct. That  
11 was -- our scenarios were predicated on the fact that  
12 we had the resources to do the jobs that we have put in  
13 those scenarios.

14 Q. All right. Thank you.

15 And Mr. Wilson, earlier on this panel you  
16 told us that of the \$240 million redirected from  
17 nuclear pre-engineering, there have now been \$220  
18 million allocated to programs or channelled through to  
19 their eventual end uses which would leave about \$20  
20 million as yet unaccounted for; is this true?

21 MR. WILSON: A. I don't recall  
22 mentioning \$220 million, but the number should be  
23 approaching \$200 million at this point, yes.

24 Q. So there is some money left over from  
25 that reallocation that hasn't yet been specifically

1 targeted for demand management?

2 A. Yes.

3 Q. Thank you. This would suggest to me  
4 that resource allocation is not right now a constraint  
5 on demand management activities. There is money to do  
6 the next items on your roster; is this true?

7 A. Yes, there is.

8 Q. Thank you.

9 A. I guess the question is: Is there  
10 any constraint? I think there is a constraint, but the  
11 constraint is partly external and partly internal.  
12 Certainly, the external constraint is how fast can you  
13 move and how fast can other people move to put products  
14 together and put their side of the program delivery in  
15 place.

16 Those are real constraints in program  
17 constraints and we have explained that at some length.  
18 And the internal constraints are assembling program and  
19 business plan cases that are sufficiently convincing to  
20 our senior management and to the Board of Directors  
21 that the money will be well spent.

22 Q. Yes, I understand.

23 A. So within the general permission to  
24 proceed at full speed, there are real constraints and  
25 we struggle with them when we are not here.

1                   Q. I appreciate that. Money right now  
2 isn't a constraint for demand management; is that  
3 right?

4                   A. I would think that is probably true.

5                   Q. Thank you. I would like to talk  
6 about the model of technological change, technological  
7 evolution that Ontario Hydro assumes for  
8 energy-efficient technologies.

9                   I think, Mr. Burke, you most clearly  
10 explained the framework starting at transcript Volume  
11 52, page 9481. Again, if you would like, you can turn  
12 it up. I won't be quoting from that directly. I put  
13 that on the record for reference.

14                  But if you would please turn up new  
15 Exhibit No. 311 and turn to page 1 of that new exhibit,  
16 and we have the overhead. I have produced a schematic  
17 here which I hope is representative of the basics of  
18 the model and I will talk about what I have meant to  
19 represent by this more in a minute.

20                  From reading that transcript reference  
21 that I referred to, Mr. Burke, Hydro's forecast, if I  
22 understand it, of energy-efficient improvements is  
23 meant to be a snapshot of a dynamic evolution of  
24 technology. You referred to the word "snapshot" a  
25 couple of times in the last few weeks.

1 MR. BURKE: A. Yes. The estimate of the  
2 megawatt impact of efficiency improvements is estimated  
3 using a snapshot based on current technology for  
4 electrical efficiency improvement.

5 Q. Thank you. Movement in the schematic  
6 that I have here is from top to bottom as you can see  
7 and there are three things happening as we move from  
8 top to bottom on this page.

9 The first thing is that time runs from  
10 top to bottom as you can see by the time arrow on the  
11 right side of the page; and the second movement is that  
12 price also runs from top to bottom except that price  
13 decreases as we go down the page, as is indicated by  
14 the arrow on the left side of the page.

15 Would you agree, Mr. Burke, that,  
16 generally speaking, this is the pattern that we see in  
17 technological evolution, that as time runs, the price  
18 for any given technology will come down?

19 A. As long as that technology is  
20 actually increasing market share. I mean, you can find  
21 technologies that disappear in the marketplace because  
22 they just aren't the leading edge technology.

23 But I presume you are talking about the  
24 technologies that, in fact, make it in the marketplace  
25 and develop through a normal saturation curve to a high



1 penetration rate and their price will fall.

2 Q. Yes. Thank you.

3 A third movement on the page is the  
4 evolution of the technology itself. And I have  
5 represented two categories of technology here by two  
6 boxes. The first is labelled "induced EEI" and is  
7 meant to house technologies that must be program driven  
8 to ensure implementation, not a new concept for this  
9 panel. And the second is labelled "natural EEI" and  
10 houses technologies that are naturally implemented  
11 without the necessity of incentives or other  
12 inducements.

13 And if I understand Ontario Hydro's  
14 model, any snapshot will reveal a number of  
15 technologies in each box and these technologies in  
16 aggregate would represent a total potential EEI  
17 captured in the forecast for that particular point in  
18 time.

19 But underlying the snapshot is a  
20 movement, an evolution, which is driven primarily by  
21 price. So I have shown new technologies appearing  
22 towards the top of the page and as time runs, price  
23 comes down as we have just talked about. That is  
24 generally correct. And technologies drop into the  
25 induced box and then as time runs, prices come down

1 further.

2 If all goes well in the market and  
3 technologies drop down again into the natural box,  
4 would you agree that this is generally an accurate  
5 representation of the model that you talked about, Mr.  
6 Burke?

7 A. Yes. The only comment I would make  
8 is that the new technologies you are talking about are  
9 electrical efficiency improvement technologies and  
10 clearly perhaps one of the elements that I have  
11 confused people with is clearly there are technologies  
12 that also do things other than improve efficiency.  
13 They may cause people to switch to electricity or  
14 increase the intensity with which they use electricity.

15 So, understanding that when you say new  
16 technologies at the top, you are not restricting  
17 yourself. You have to restrict yourself in this  
18 diagram purely to the efficiency improvement ones and  
19 that there is technological evolution in areas which  
20 are not strictly efficiency improvement.

21 Q. But for the purposes of Ontario  
22 Hydro's model and its assumption about the evolution of  
23 efficient technologies, this accurately characterizes  
24 that?

25 A. Yes.

1 Q. Thank you.

2 Now, it seems to me that Ontario Hydro's  
3 model as related by you, Mr. Burke, assumes two things:  
4 First of all, that while it isn't clear what particular  
5 technologies will appear in the induced box in any  
6 given snapshot, the megawatts of savings represented by  
7 the box can be estimated with some of confidence. You  
8 spoke about that this morning.

9 Is that a fair characterization?

10 A. Well, the only reason that they can  
11 be estimated with some confidence is that if we take  
12 the snapshot today, we have a fairly good sense of what  
13 the members of each of the two boxes is, especially  
14 with the approach we take; that is, to have a  
15 requirement that we know what the cost and performance  
16 of technologies are that are included in the induced  
17 box.

18 So, it is readily estimated as long as we  
19 make the assumption that, in fact, the snapshot that we  
20 take today is, in fact, a good estimate of future  
21 relationships between those two boxes which is an  
22 assumption.

23 Q. But based on the technologies that  
24 you have identified in the box today, you take a  
25 snapshot today and you project out into the future a

1 forecast of the demand management potential.

2 And so with reasonable confidence in your  
3 opinion, at any time in the future within your forecast  
4 range, you are able to tell us how much potential will  
5 be around at that time?

6 A. Yes, but I am not projecting the  
7 technology then, I am projecting the market to which  
8 that efficiency improvement applies.

9 The difference in the technologies in the  
10 induced box and the natural box, to use your diagram,  
11 give me the efficiency gain that I should apply to the  
12 eligible market segments. And those evolve over time  
13 and they are forecasted in the basic load forecast.

14 But the per cent improvement in the year  
15 2000, which is the focus of our potential analysis for  
16 the most part, the snapshot is taken now and that  
17 number, the efficiency gain, potentially doesn't change  
18 over time.

19 Q. And the market at any point in the  
20 future is obviously influenced by the technologies  
21 available in the future. You say that you project what  
22 the market will be.

23 A. Yes.

24 Q. You, in fact, project what the  
25 potential energy efficiency improvement is in any given

1 year and that is certainly, to a very great extent,  
2 depends on the energy-efficient technologies that will  
3 be available in that year; is that true?

4 [11:50 a.m.] A. Yes. But I think it is quite clear  
5 that I am not projecting what I think the spectrum of  
6 technologies available in the year 2000 will be, what  
7 their cost and performance will be, because I cannot  
8 know that. I only know what they are today.

9 Q. Yes, I understand that. In fact, you  
10 made it quite clear that the mix of technologies in the  
11 box at any time in the future is not something that we  
12 should be trying to pin down with any great accuracy  
13 right now, it's very difficult to do.

14 A. That's correct. It's the megawatt  
15 difference between the two that's important.

16 Q. Thank you.

17 The second point that I wanted to ask you  
18 about, and I think the model also incorporates this  
19 point, is that as time runs technologies drop down  
20 through this framework and they collect in the natural  
21 box and the growth in the number of megawatts contained  
22 in the natural box is captured by Hydro's basic load  
23 forecast; is that right?

24 A. Yes.

25 Q. And this morning with Mr.



1 Klippenstein you were talking about this very  
2 evolution, and Hydro's model assumes that the boxes  
3 evolve -- or it's not the boxes evolving, the megawatts  
4 of saving, the evolution of the technology in the  
5 market keeps pace, the evolution in the induced  
6 category keeps pace with the evolution in the natural  
7 category, so that there is not a big disorientation  
8 between the two as we trace our development outwards in  
9 time; is that what you said?

10 A. Implicit in what I am doing, the way  
11 the current methodology works is they go in parallel.

12 Q. Thank you.

13 These assumptions, it seems to me, are  
14 really based on the premise that efficient technology,  
15 and so the market for efficient technology, will evolve  
16 at the same rate that it has historically; do you think  
17 this is correct?

18 A. I don't think it is a question of  
19 what the historical rate is; simply that technology  
20 does evolve. If I had a lot of good information about  
21 the rate at which technology had evolved historically  
22 at low cost and at high cost, to know more precisely  
23 which part of this diagram moves faster, I would use  
24 it. But because that information doesn't exist, I am  
25 obliged to assume that the technical change effectively

1 occurs in a parallel fashion, as I just described,  
2 equally at the top end and the bottom end of the  
3 market.

4 Q. By the same token, you can project  
5 for any point in the future of your forecast with some  
6 degree of confidence what the potential EEI would be at  
7 that point. So you are assuming a regular evolution of  
8 the technologies in the market that traces them into  
9 the future?

10 A. I am making that assumption, yes.

11 Q. Given the newness of the efficiency  
12 culture and market in Ontario, and industry in fact in  
13 Ontario, do you think that simple extrapolation of a  
14 regular pattern accurately reflects with confidence  
15 what is going to happen with efficiency in the near and  
16 in the median future?

17 A. I think the major element that is  
18 different in -- or could potentially be different in  
19 the next 10 or 20 years from the past is the extent to  
20 which electrical utilities and other government  
21 agencies in North America and elsewhere have an effect  
22 on the evolution of technology in the marketplace. To  
23 the extent that technologies actually get demonstrated  
24 faster and sooner, it might mean that the rate at which  
25 efficiency improvement occurs is faster than in the

1 past.

2 The difficult question is whether having  
3 more candidates perhaps for the induced box than  
4 before, that is because companies realize that  
5 technologies that would not pass normal market tests  
6 would be promoted by utilities through their programs,  
7 whether that will actually lead to a situation where  
8 again the basic assumption is invalidated, and that is  
9 that the induced EEI box actually evolves faster than  
10 the natural EEI. I still don't know that.

11 That EEI in general may proceed at a  
12 faster pace than in the past through the activities or  
13 the increased activities of utilities in the  
14 marketplace. That I would accept as a possibility and  
15 could have an impact. But whether it will actually  
16 change the relationship between what is induced and  
17 natural, that I still can't tell.

18 MS. FRASER: A. What you may get is  
19 different ways or different technologies which will  
20 achieve the same savings so we have a broader choice of  
21 technologies. For example, in exit signs it used to be  
22 that you would go from an incandescent lamp to compact  
23 fluorescent for a typical exit sign application.

24 There are no exit signs in this room at  
25 all. I guess there is no way out.

1 MR. B. CAMPBELL: Not for you.

2 (Laughter)

3 MS. FRASER: Oh, Oh.

4 Anyway, there are now a number of  
5 different exit sign technologies, LED's, miniature  
6 incandescents and whatnot, which are below 5 watts per  
7 exit sign as opposed to what was before below 40 or 50.  
8 So what we have is a broader choice. There has been an  
9 improvement in the energy efficiency overall but it's a  
10 broader choice, which I think will help improve  
11 penetration overall but it may not change the  
12 difference in the potential.

13 MR. MONDROW: Q. But you would agree  
14 with Mr. Burke that it is conceivable that as the  
15 culture changed that we would all like to see, as Mr.  
16 Wilson has testified to, takes hold, hopefully, in  
17 Ontario, we could get patterns of change in evolution  
18 and increases that we can't anticipate?

19 MS. FRASER: A. Yes, I was agreeing with  
20 that. It would probably get wider as well as deeper.

21 Q. Thank you. I would like to move to a  
22 slightly different topic, although it still relates to  
23 the model generally, and that's avoided cost.

24 As late as this morning, Mr. Shalaby, you  
25 told us that there weren't too many cliff hanger

1 technologies out there, and it has been this Panel's  
2 evidence all along that very little has been ruled out  
3 because it's uneconomic when set up against the total  
4 customer cost test. This this is a fair paraphrase, I  
5 hope, of your evidence.

6 MR. BURKE: A. Yes.

7 Q. Thank you.

8 And, of course, this means that the same  
9 is true for the foreseeable future, the future that you  
10 forecast. If the avoided cost took a jump three years  
11 from now, or five years from now, or at the end of this  
12 hearing, for example, that wouldn't change the forecast  
13 of your demand management potential, your EEI potential  
14 and your penetration rates and so on, because it  
15 wouldn't capture that many more new technologies; is  
16 that Ontario Hydro's position?

17 A. Yes. I think it is fair to say that  
18 we have admitted that we do not have knowledge of too  
19 many technologies whose costs exceed significantly the  
20 costs, our avoided cost, and that is probably because  
21 the market has not been interested in even exploring  
22 things that are that expensive.

23 So, I wouldn't want to blankly rule out  
24 some incredible changes in avoided cost wouldn't change  
25 potential. But in the range, in the region that we



1 have been dealing with, I think it is a fair statement.

2 Q. I guess this is my problem with that  
3 premise. If we take a look at the model again, what  
4 that would mean, if you accept that premise, is that  
5 technologies that appear on the market would either pop  
6 in to this picture within the induced box, the top of  
7 which is defined by Hydro's avoided cost, or somewhere  
8 off the spectrum, they wouldn't even appear on this  
9 page. And it just seems to me that as markets and  
10 technologies and science evolves we would get new  
11 technologies appearing at a whole spectrum of price  
12 ranges which could be anywhere on this line; some would  
13 be off the page, some would be right in Hydro's avoided  
14 cost barrier, and there would likely be a whole bunch  
15 in between. Is that not a more intuitive depiction of  
16 the evolution and the development of technology?

17 A. I think some things can appear in the  
18 labs as possibilities, but if their costs are well  
19 outside the range where someone could hope to ever  
20 commercialize the product, they wouldn't be developed  
21 further.

22 So, you're right, I am sure there are all  
23 kinds of technologies that people have thought about,  
24 and maybe even a prototype somewhere for that are  
25 extremely expensive, and just -- there is no

1 possibility that they could be brought within a  
2 reasonable range of cost. The reasonable range has  
3 typically been what the market has been prepared to  
4 pay, and there are jurisdictions in the world that pay  
5 much more for electricity than we do, and so there are  
6 some markets that way. And increasingly there are  
7 markets where people do just purchase energy efficient  
8 products because they wish to purchase energy efficient  
9 products, independent of economics. And then there is  
10 the third market which is the utility sponsored or  
11 utility program area which looks at technologies  
12 against avoided cost.

13 But on a life-cycle basis, I would think  
14 these technologies would still have to come in that  
15 range to be pursued, and I think that's why there is a  
16 derth of these very expensive technologies that anybody  
17 knows much about, because while they may be technically  
18 possible, in fact the economics are so bad that we  
19 never hear about them.

20 Q. In fact, what I thinking about are  
21 not the very expensive technologies but the  
22 technologies that fall somewhere under very expensive  
23 but somewhat over Ontario Hydro's avoided cost. And  
24 given the future involvement of government and  
25 utilities in trying to harvest energy efficiency, it

1 would seem to me that companies would try to develop as  
2 many products as they could, and it is likely that many  
3 of these products would fall somewhere close to the  
4 avoided cost but above it on the spectrum. Is this not  
5 a fair guess, Mr. Burke?

6 A. Well, I would be speculating. I  
7 think that companies don't go out to find technologies  
8 at a certain cost. Technologies emerge and then they  
9 are costed out.

10 I can just observe that across North  
11 America in the supply curves of conserved energy that  
12 are produced, there are very few examples of high cost  
13 technologies.

14 Q. By high cost you mean more than  
15 avoided cost?

16 A. Costs that exceed our avoided cost.

17 Q. Mr. Wilson, at Volume 50 of the  
18 transcript, and maybe I will tell you the point I am  
19 getting at and you can turn it up if you want to. It  
20 was at page 9041, you said that if money were no object  
21 there would be a lot more demand management.

22 Could you reconcile this statement with  
23 what Mr. Burke and I have just been talking about?  
24 It's Volume 50, page 9041. It's around line 22.

25 MR. WILSON: A. I was just doing a

1 little background reading here.

2 Mr. Poch was asking me questions, I  
3 think, of a hypothetical nature, dealing with applying  
4 weights to environmental consequences and whether that  
5 would make any difference in the assessment of what was  
6 economic. I am not sure if that's entirely correct,  
7 but why don't you go ahead with your question.

8 Q. Do you think that if avoided costs  
9 were higher there would be more technologies captured  
10 in the potential EEI? I'm sorry, let me rephrase the  
11 question.

12 That's not what you were saying at this  
13 page in the transcript?

14 A. I think what we are discussing here,  
15 we are talking almost of this notion of a technical  
16 potential, and if we were not concerned about what was  
17 economic and the only concern was, what could you do to  
18 to reduce electricity use, and consequently money was  
19 no object, you could spend money to accomplish a  
20 reduction in electricity use, would that make a  
21 difference in how much electricity would be reduced and  
22 I said yes.

23 Q. Fair enough.

24 [12:08 p.m.] Ms. Fraser at Volume 52 of the  
25 transcript, page 9403, you talked again with Mr. David

1 Poch and you talked about technologies that were cost  
2 effective before -- not cost effective.

3 MS. FRASER: A. Sorry?

4 Q. It is Volume 52, page 9403. It is  
5 about line 25. And you were talking about technologies  
6 that were not cost effective before but for which 80  
7 per cent of incremental cost incentives might help to  
8 capture some savings now.

9 And I believe it is the top of the next  
10 page, Mr. Poch referred to technologies on the margin.  
11 What did you take this reference to "technologies on  
12 the margin" to mean?

13 A. This was dealing with the  
14 unidentified part which was included in the 1989  
15 Demand/Supply Plan and which has since disappeared.  
16 And we had assumed an incentive rate for 50 per cent  
17 for all those technologies which were identified and an  
18 80 per cent incentive for technologies which were  
19 unidentified.

20 And so it was those opportunities at the  
21 margin, those unidentified ones, would have a higher  
22 incentive level that we expected that they would  
23 probably be more costly and because they were newer  
24 would require a higher incentive to get the penetration  
25 that we would want to get out of them.



1 Q. If we go back to page 9403 at the  
2 bottom, the last line there, starting at the second  
3 last line actually, you said:

4 "They are things that were not cost  
5 effective before."

6 And then when we flip over the page, you  
7 talk about bringing them down closer, on page 9404.

8 I read that as saying that there were  
9 technologies that weren't cost effective and now are  
10 cost effective; is that not an accurate reading?

11 A. Oh, that has to do with the evolution  
12 that you have just described here--

13 Q. Right.

14 A. --in terms of things moving from your  
15 new technologies into something that we could then  
16 induce, which is assumed to happen in our assumptions,  
17 as I understand what Mr. Burke has said.

18 Q. I see. Let me ask you another  
19 question, Ms. Fraser, and Ms. Mitchell actually agreed  
20 with Mr. Poch and I will just give you the reference  
21 for the record. It was at Volume 53, page 9622, around  
22 line 21, that Tungsten-Halogen lamps are a technology  
23 determined not to be cost effective but under higher  
24 avoided cost levels might be.

25 And later that same morning, as a matter

1 of fact, you updated us, that aversion of the  
2 Tungsten-Halogen technology, the initials PAR, the PAR  
3 lamp will henceforth be included in your energy  
4 efficient lighting program.

5 I am not really clear about all the  
6 various technologies.

7 Is this PAR lamp the same technology that  
8 Ms. Mitchell was under the impression was not cost  
9 effective?

10 A. That is the exact point that we are  
11 dealing with here, in terms of different applications  
12 can make things cost effective or not.

13 In the residential market where you are  
14 looking at replacing lights that might be on two or  
15 three hours at a time, a technology at cost 'X' may not  
16 be cost effective.

17 If you are using that technology to  
18 replace - in this case it would probably replace an  
19 incandescent pot light or either a flood or a spot - in  
20 retail stores which are operating 12, maybe 14 hours a  
21 day, the whole avoided cost scenario looks different  
22 for that same technology. It is not the fact that the  
23 technology costs change. The avoided costs are  
24 different because the load profile of the application  
25 is different. And I think that is also something that,

1       you know, is reflected in our estimates of potential.  
2       It gets back to the T8 lights and religious buildings  
3       again.

4                   Q.   So when Ms. Mitchell referred to a  
5       study that was done on bulbs and the study determined--

6                   A.   For residential.

7                   Q.   --that the bulbs weren't cost  
8       effective, it was not a change in the technology price;  
9       it was a change in the use pattern of the bulbs. Am I  
10      understanding you?

11                  MR. MacLELLAN: There was a change in the  
12      use pattern, plus a change in what it was replacing.  
13      The Halogen bulbs that she was talking about originally  
14      were designed to replace a standard A-line normal  
15      incandescent light that you have in every table lamp in  
16      your house likely.

17                  So you are talking about a fairly high  
18      priced technology replacing a 60, 70 cent light bulb;  
19      whereas the PAR lamp is a flood or spotlight. So very  
20      different applications and you are also using that  
21      Halogen product to replace an incandescent PAR which  
22      costs from \$6.00 or \$7.00 as opposed to 60 or 70 cents.  
23      So, it is a case of the application and it is a case of  
24      what it is replacing in terms of economics.

25                  Q.   It would seem to me that with light

1 bulbs, as an example, energy-efficient light bulbs,  
2 there is a spectrum of uses, different applications and  
3 whether you put one in the hall closet or in the  
4 kitchen and a whole bunch of rooms in between with  
5 various levels of daily use. And cost effectiveness,  
6 of course, is affected by the frequency with which  
7 these bulbs in this example are used.

8 Would that not suggest that there is a  
9 spectrum of avoided costs for these technologies and,  
10 in fact, your programs capture some of them in some  
11 applications but a change upwards in avoided cost would  
12 very likely --

13 MS. FRASER: A. Are you suggesting that  
14 we ask people to turn their closet lights on for 24  
15 hours a day so that they would then be cost effective  
16 for us to replace them?

17 Q. Not at all. What I am suggesting is  
18 that if your avoided costs went up, perhaps a few more  
19 applications in the light bulb example would be  
20 captured under the test; would you agree with that?

21 A. Could be, sure.

22 MR. MacLELLAN: A. Yes.

23 Q. Thank you.

24 MR. SHALABY: A. I hate to spoil all of  
25 this, but avoided cost can also go up; it can also go

1 down. Certainly, it is not a unitary direction for  
2 avoided costs. They can go up or down. and if they go  
3 down, then many opportunities that we screen to be  
4 economic may, in fact, turn out to be uneconomic at a  
5 future date.

6 Q. Certainly. I take your point. Thank  
7 you.

8 I guess I have one more question on the  
9 general theme of the model. For the Demand/Supply  
10 Plan, Hydro, as Ms. Fraser, you have mentioned, took a  
11 stab at estimating - and, I believe, the words were  
12 something like - 'imminent impacts of emerging  
13 technologies and new ideas for enhancing penetration'.  
14 This is the unidentified EEI category and it is talked  
15 about and defined in Exhibit 3 at page 710.

16 But by the time of the 1990 demand  
17 management forecast, we had an increase in EEI  
18 potential by the year 2000 of 1470 megawatts and the  
19 unidentified category has been spent. Indeed, Mr.  
20 Wilson, you have told us that all energy efficient  
21 technology is now identified; is that true.

22 MR. WILSON: A. I think that is true,  
23 except for industrial. And this was subsequently  
24 explained in the industrial sector there. We have made  
25 provision for increases of potential and attainable



1       that we don't have specific details for, but it is near  
2       a process efficiency.

3                   Q.   Yes.   In fact, I will have a question  
4       on that in just a minute.

5                   Is it Ontario Hydro's position then that  
6       the fortuitous addition of several technologies to the  
7       roster between 1988 and 1990 which accounted for the  
8       increase in EEI potential was a one-time windfall and  
9       that, as you have said, the unidentified category is  
10      now empty and there are no other unforeseen  
11      technological advances that will enter the market in  
12      the avoided cost ballpark and change the forecasts  
13      again upwards?

14                  MR. BURKE:   A.   I guess the answer is  
15      that there may be new technologies enter, but when we  
16      completely redo the basic load forecast and consider  
17      what is natural, that we expect to find over time that  
18      there will be increased efficiency gains in the natural  
19      as well and that the net effect may -- well, it is our  
20      assumption, will be roughly the same as before.

21                  Right now we have added to the potential  
22      and we may expect that we may add it, I guess at some  
23      points in future, but I would also expect that we will  
24      observe changes in the assumptions about natural EEI  
25      over time and that these should balance out.

1 Q. By balance out then, you mean that  
2 the pace of the two boxes that I identified earlier  
3 would stay -- the pace would be relatively the same?

4 A. I expect so. I think most of the  
5 changes that we made between 1988 and 1990 were things  
6 that we were aware of and we were watching, but we  
7 hadn't enough information at the time to feel  
8 comfortable with going with those options.

9 The retrofit housing example was a clear  
10 case of much more additional information. I am not  
11 suggesting we won't get new information in the future,  
12 but I think some of the major chunks of potential have  
13 been essentially much better handled in the 1990 case  
14 than we could in 1988.

15 And it is not that the difference is a  
16 pure function at all of the evolution of technology.  
17 It is more a function of better information about  
18 technology and its application in Ontario. So that I  
19 would expect that we will not have big changes like  
20 occurred between 1988 and 1990 again. I could eat my  
21 words, but that is my expectation at this point.

22 Q. After Exhibit 76, we were given a new  
23 exhibit that incorporated fuel switching and standards  
24 which, of course, wasn't foreseen, at least explicitly  
25 in Exhibit 76 and we have another big chunk now added

1 to the demand management forecasts.

2 This then, too, is probably a one-time  
3 thing; is that your position, Mr. Burke?

4 A. Well, the fuel switching example, I  
5 think we have indicated in the document 257 and 258  
6 that there are options in that general category of  
7 demand reduction, electricity demand reduction, that we  
8 have not pursued at this point. We have been specific  
9 in that we have restricted ourselves to gas available  
10 areas and certain things we have not included.

11 So, I would say that, depending on the  
12 circumstances and the direction of government policy  
13 and so on, I wouldn't claim that these numbers are at  
14 all the last word. They are preliminary.

15 Q. I guess the point I am making is that  
16 we have seen a couple of changes even in the recent  
17 past and it is not inconceivable that we will see  
18 leaps, maybe even quantum leaps, coming from directions  
19 that we can't expect you now to capture; is this fair?

20 A. There is a risk of that, yes.

21 Q. And we are certainly all pushing for  
22 a cultural change in Ontario. And, in fact, it seems  
23 that much of the world, certainly much of North  
24 America, is very interested in green ideas in  
25 efficiency and conservation. This is something that is

1       unprecedented, wouldn't you agree?

2                   A. Yes, but I would remind you of  
3       discussions we have had in Panel 1 and I guess earlier  
4       in this panel that suggests the direction of the  
5       greening of the world do not necessarily unambiguously  
6       mean a purely efficiency gain in electricity, that  
7       there may be applications of electricity that are more  
8       environmentally benign than the current fossil fuel  
9       application.

10                   And I found it quite interesting that the  
11       Ministry of Energy would recognize this in the  
12       industrial sector and in particular in their high  
13       conservation scenario that they proposed in Exhibit  
14       249, where effectively almost all the efficiency gains  
15       in the industrial sector were offset by increased use  
16       of electricity for environmental reasons.

17                   And we have essentially suggested that it  
18       is far from clear where the impacts of environmental  
19       policies will net out on electricity demand at this  
20       point in time. So, that we are focusing on the  
21       efficiency side of things and that is why I wanted to  
22       be quite clear with your diagram that there was  
23       efficient technologies in electricity use.

24                   There is a whole realm of technological  
25       change which may move to increase the use of

1 electricity. One was brought up recently by AMPCO, the  
2 electric vehicle, which has also the potential to be  
3 seen as environmentally benign and would increase load  
4 and would be efficient at a certain level.

5 Q. Ontario Hydro is not actively  
6 marketing any of these electro-technologies. That is  
7 your evidence, isn't it?

8 A. Yes.

9 Q. And it seems to me that there are at  
10 least two major ways to help the environment: One is  
11 to switch off of fossil fuel, for example, and at least  
12 from the end user's perspective, use electricity if it  
13 is more efficient technology. And the other is, at the  
14 same time or perhaps an alternative to that, cutting  
15 down the amount of electricity consumed in any given  
16 process; that is, you can either take up more efficient  
17 electro-technology or you can use more efficiently the  
18 electric technology that you have or hopefully do both;  
19 is that right?

20 MR. WILSON: A. I think if you are  
21 concerned about environmental effects on the natural  
22 environment, you would try to use electricity more  
23 efficiently. You use other fuels for -- they are more  
24 benign from an environmental point of view and switch  
25 to electricity where that is more environmentally



1 benign.

2 So this is a very tangled issue and there  
3 is no simple answer to which direction does that push  
4 electricity use.

5 Q. I would certainly agree with that.  
6 Thank you.

7 Ms. Fraser, Exhibit 260 I would like to  
8 refer to at page 38. I might have you flipping a bit.  
9 We were told there -- and perhaps I will just read the  
10 quote. I don't think it will be contentious:

11 "Increases in potential induced  
12 EEI for the industrial sector from the  
13 1988 forecast to the 1990 forecast are in  
14 part due to technologies not yet  
15 specified."

16 And we are referred to Exhibit 276. And  
17 at page 52 of Exhibit 76, and perhaps I will just read  
18 this for you. It might save you some shuffling time.  
19 In the last sentence on that page, we are told that of  
20 the 900 megawatts estimated EEI potential by 2000 in  
21 the industrial sector, 380 megawatts are to come from  
22 "other technologies and processes whose load impacts  
23 have not yet been quantified".

24 My question is pretty simple, I think:  
25 How do you know that you are going to get 380 megawatts

1 from measures whose load impacts have not been  
2 quantified?

3 MR. BURKE: A. I guess, because it is in  
4 the realm of the potential, I will venture forth. We  
5 have based this estimate on the judgment of a group of  
6 experts in-house and I think Ms. Fraser has given  
7 examples of technologies that could well make up that  
8 380 megawatts previously in this --

9 MS. FRASER: A. Correct. I believe I  
10 identified 360 of those megawatts have now --  
11 subsequent to the preparation of Exhibit 76, 360 of  
12 those have been specified per se.

13 Q. So, we still -- oh, I am sorry.

14 MR. BURKE: A. It is quite clear and we  
15 have stated it up front in our direct evidence and  
16 subsequently, that further study needs to be done in  
17 the area of the industrial potential, especially as it  
18 becomes much more process specific, because there is  
19 room to certainly -- there are areas that we do not  
20 have knowledge of. And when that information becomes  
21 available, we will probably end up increasing the  
22 potential in the industrial sector.

23 Q. I would like to ask you one question  
24 about new Exhibit 312. I realize that I didn't have it  
25 to you until this morning. This is a little item I saw

1 in the Globe this past Saturday. And it appears that  
2 EPRI has developed a microwave clothes dryer that it  
3 hopes will reduce both electricity costs and drying  
4 time.

5 Has Ontario Hydro done any investigation  
6 of the impacts of this particular technology?

7 MR. MacLELLAN: A. We have looked at the  
8 technology. Apparently, the jury is still out on  
9 whether or not it is going to be a commercially  
10 available product soon or ever.

11 There is some doubt by some microwave  
12 experts that it will, in fact, perform, but we are  
13 keeping an eye on it, I guess is the answer.

14 [12:30 p.m.] Q. So I guess that means that where it  
15 to develop to a stage where it would hit the market,  
16 you wouldn't have any idea now what kind of price range  
17 it would fall in?

18 A. It seems to be somewhere between 10  
19 and 20 per cent more. That's a projection made from a  
20 prototype assuming certain quantities in the  
21 marketplace. It's not a huge increase over the current  
22 product.

23 Q. Could you tell me how this would  
24 relate to avoided cost for that particular technology?  
25 Would it pass?

1 A. We haven't looked at that.

2 Q. Okay. Thank you.

3 I will just pause here for a second, Mr.  
4 Chairman, and everyone else. I should let you know  
5 that Mr. Diener will have to unfortunately leave a bit  
6 before the lunch break, so when he gets up to leave  
7 that's what is happening.

8 Having said that, I would like to move on  
9 to another area, please.

10 As this morning, although along a  
11 different line, I would like to look at a few examples  
12 of total customer cost test and how that works, my  
13 understanding of that test. The way I understand the  
14 total customer cost test, and I will be very brief, I  
15 know you have gone over this several times, is that you  
16 take the incremental equipment costs for the efficiency  
17 and you add Ontario Hydro's program costs and you  
18 subtract the changes in customers' operating costs,  
19 such as reduced maintenance. I think we spoke about  
20 that this morning. You get a sum and you set that up  
21 opposite avoided cost, and if that sum is less than  
22 avoided cost, it passes the economic test, and if it's  
23 greater than avoided cost it doesn't pass. And if it  
24 does pass the test, the energy management branch has  
25 the mandate to go out and get, pay up to full avoided

1 cost to get that energy efficiency in place. Am I  
2 right?

3 MR. SHALABY: A. The first part about  
4 describing the test is fine. The mandate, maybe I will  
5 leave it to the energy management people.

6 MS. FRASER: A. In terms of something  
7 that is economic in terms of technology, right, but  
8 those are technologies that were -- after.

9 In terms of what we pay, our mandate is  
10 governed by the strategic principles that are in the  
11 Demand/Supply Plan, although there are situations, and  
12 I have discussed those in detail, where we deviate from  
13 those in different specifics. Although in terms of  
14 putting the overall general plan together, it's not a  
15 general rule that we always pay full avoided cost. I  
16 mean there is lots of times that would just be silly.

17 Q. I understand that completely from  
18 your evidence. If fact, when you can pay less than  
19 full avoided cost -- the less you can pay and still get  
20 the measure, obviously the better for everybody. But  
21 the mandate is there nonetheless and I realize that  
22 there are a lot of strategic principles that you still  
23 apply in various cases and various ways. But is it a  
24 fair generalization, distillation, I will put it, to  
25 say that if you have to pay up to full avoided cost to



1 get an economic measure, you will do that? That's been  
2 your evidence, hasn't it?

3 A. What you are talking now is the  
4 utility cost test, and at this point we don't have any  
5 specific guidelines whether or not that has to be  
6 positive or negative. But we do look at it, when we  
7 use that test to compare alternatives within programs.  
8 I don't know if we could quite characterize it the way  
9 you have asked me to.

10 I use the utility cost as a mechanism to  
11 look at the perspective from Ontario Hydro on different  
12 program alternatives when you are looking at a  
13 particular program area. So, there is different ways  
14 to get it and obviously you are going to want to  
15 maximize the the benefit to the utility, all things  
16 being equal. So if you are going to get the same  
17 megawatts and one test was positive and one test was  
18 negative, you would take the one that was positive.

19 Q. I understand, and there were a number  
20 of tests that you spoke about in your direct. But my  
21 understanding of the evidence was that these other  
22 tests, including the utility cost tests, are applied to  
23 program design and they assist you in harvesting the  
24 demand management in the best, most cost-effective way.

25 But my understanding of the evidence is

1 that if you have to pay full avoided cost, if that's  
2 the only way you are going to get it, that's the  
3 ultimate test of whether you are going to go out and  
4 get that option; isn't that true?

5 A. If we are down to that determination,  
6 yes. I think the example I gave of that was a specific  
7 thermal cool storage program.

8 Q. Yes, I remember. Thank you.

9 If you could bear with me for just a few  
10 minutes, I hope we can do this fairly quickly. I would  
11 like to go through a couple of examples, and just try  
12 to get out a few points here. If you look at page 2 of  
13 new Exhibit 311, and I have mentioned the correction to  
14 this page. I am hoping that these figures will guide  
15 us quickly through a hypothetical.

16 Assume that a university comes to you,  
17 Ms. Fraser, and maybe we could use your savings by  
18 design program, or some permutation of that, the  
19 understanding that I am trying to get at is that the  
20 customer comes to you with a package of proposed  
21 options, it's either for new construction or as part of  
22 a retrofit project, and if the package meets the total  
23 customer cost test, it becomes economic, and then  
24 subject to the other tests that you apply to figure out  
25 the best way you can harvest this demand management,

1 you procure that option or that package of options; is  
2 that right?

3 A. Not quite. The program is already  
4 designed and we have applied these other tests on a  
5 program basis, making certain assumptions about what  
6 the packages that we are going to see are. What we do  
7 at the point at which we actually have a project that  
8 comes to us or we go out and get is then do a test at  
9 that project level as well to make sure it passes the  
10 TCCT. The incentive level and whatnot has already been  
11 determined by the program design in advance of that.

12 Q. I am thinking of a scenario where a  
13 customer comes to you with an option, we can even  
14 simplify it and say one option, and that's the  
15 hypothetical I would like to pursue here, if we could  
16 go on that basis. I'm sorry if I have muddled the  
17 waters by referring to the specific program, but there  
18 are a lot of programs as you well know.

19 A. Sure.

20 Q. So the hypothetical I am getting at  
21 is the customer comes to you with an option. The  
22 university in our case comes to you and has identified  
23 a measure or some interrelated measures, and they have  
24 determined that their incremental cost is \$1,100,000,  
25 as listed at the top of the page here, and they also

1       figured on a net present value basis they are going to  
2       save \$800,000, and the project -- let's assume that the  
3       option life here is three years -- the net present  
4       value of those savings would be \$800,000 to the  
5       university.

6                   A. What is included in those savings?

7                   Q. Electricity bills basically, the  
8       reduction of electricity bills.

9                   A. Anything other than that in terms of  
10      savings would be included in or netted from the  
11      incremental costs.

12                  Q. I understand, and that's actually the  
13      correction that Mr. Shalaby made to Exhibit 3 earlier  
14      in this panel?

15                  A. Correct. So the net present value of  
16      the savings is the energy savings.

17                  Q. That's right. We can assume that is  
18      all it is for the purposes of my questions.

19                  And the University feels that it wants  
20      to do something good for the environment and set an  
21      example which is good from everyone's perspective, and  
22      so they say, if you just make us whole, if you just pay  
23      us the difference between our cost and our bill  
24      savings, \$300,000, we will go ahead and implement this  
25      package and maybe we can get our students to do some

1 studies and things like that.

2 So, you take that option and you run it  
3 through your avoided cost program, and the avoided cost  
4 drops out the bottom at a million dollars. And what  
5 this says to me, your total customer cost test says to  
6 me that in this particular case we fail the total  
7 customer cost test, and the matter ends there, that  
8 option isn't pursued, at least from Hydro's  
9 perspective; is that correct?

10 A. That's correct. Basically you just  
11 take the incremental cost and you are ignoring program  
12 costs here but that would only make the right-hand side  
13 of the equation higher. Avoided cost, if it's less  
14 than -- more than avoided cost it doesn't pass.

15 Q. I am purposefully being simple here.  
16 There are a couple of concepts that I am trying to get  
17 at. I will take you quickly through another one on  
18 page 3 of that same exhibit.

19 THE CHAIRMAN: Actually, they might make  
20 it with the 10 per cent override in this particular  
21 case.

22 MS. FRASER: That's right. It would be  
23 right on.

24 MR. MONDROW: I am sorry, Mr. Chairman,  
25 by the 10 per cent I understand you to mean the



1 preference premium?

2 THE CHAIRMAN: Yes.

3 MR. MONDROW: Q. I am assuming that  
4 that's in the avoided cost for appraisal purposes; is  
5 that right, Mr. Burke? The 10 per cent is included in  
6 the very gross simplification I have made of your  
7 computer run of avoided cost?

8 MR. BURKE: A. If you want to include,  
9 it's there.

10 Q. Doesn't Ontario Hydro include that 10  
11 per cent for evaluating demand management options?

12 A. Yes.

13 Q. Thank you. I certainly want to  
14 include it, yes. At least that much.

15 The second example, page 3.

16 MR. SHALABY: A. Your word "avoided  
17 cost" is avoided cost including a 10 per cent premium.

18 Q. Avoided cost for the purposes of  
19 appraising the demand management option, that's right.  
20 And that would include the 10 per cent preference  
21 premium.

22 A. Avoided cost plus 10 per cent.

23 MS. FRASER: A. Which is exactly what we  
24 use in the savings by design for our energy saving  
25 option.

1 Q. Thank you.

2 The next example, a direct customer comes  
3 to you this time, they can implement something for a  
4 million dollars incremental cost. They have calculated  
5 that their net present value savings over the same life  
6 of the option is \$600,000, and they too ask just for  
7 the incentive required to make them whole. They want  
8 to do something good for the environment, they want a  
9 little good public relations. So they say, "If you pay  
10 us \$400,000 we will do this." If you do the avoided  
11 cost run including the 10 per cent preference premium  
12 and, lo and behold, the same number drops out the  
13 bottom. The benefits to the system are exactly the  
14 same as the case of the university that you just had to  
15 turn away because the tests weren't met, a million  
16 dollars, and so we get a passing of the total customer  
17 cost test. And if I understand your evidence  
18 correctly, and I am simplifying, but assuming that you  
19 have to pay the \$400,000 to get this, you will pay the  
20 \$400,000; is that right, to get this million dollars  
21 worth of savings?

22 A. If you are dealing with the direct  
23 customer, you are talking about then an industrial  
24 customer, I would expect, so we are talking about the  
25 accelerated payback program. Basically we would buy it

1 down to a year a half payback. So this one you are  
2 essentially saying the payback is less than two years;  
3 we would provide an incentive to bring it down to a  
4 one-and-a-half year level.

5 Q. And at that point it would be  
6 economic for the customer to implement themselves.  
7 That's the purpose of buying it down; isn't it?

8 A. Yes.

9 What I don't understand between pages 2  
10 and pages 3, is the calculation, the net present value  
11 of savings, i.e., the energy savings in a particular  
12 project where you end up with the avoided costs being  
13 the same but the net present value of the electricity  
14 savings being that much different with an advantage  
15 going to a university which has, in all likelihood, a  
16 lower load factor than a direct customer. But perhaps  
17 you can explain your derivation of those numbers.

18 Q. If that becomes a problem, I will  
19 certainly try.

20 These numbers are for example purposes  
21 and I am after concepts here. I would imagine there is  
22 a whole range of differences that I could postulate for  
23 why it would cost someone this and what savings the  
24 other party would get, different activities, different  
25 buildings, et cetera.

1                   If you bear with me for a second I will  
2 go through these examples, and if it's a problem we  
3 will talk about it in a minute.

4                   I wonder if I could ask you to step  
5 outside of your specific program with the buydown.  
6 From a conceptual point of view, Hydro is willing to  
7 pay the incentive to this customer of \$400,000, and the  
8 way that it is actually paid, you buy down the payback  
9 period, et cetera, it's something I will leave to the  
10 program designers, but \$400,000 is paid to procure this  
11 million dollars worth of savings to the system; is that  
12 fair, from a conceptual point of view?

13                  A. Yes, the avoided cost minus  
14 incremental costs, again assuming zero program costs,  
15 it would be the actual cost benefit ratio of one and it  
16 would be -- go ahead.

17                  Q. Thank you.

18                  One more, and this is where the point  
19 comes in.

20                  The next page, page 4 of the exhibit, we  
21 have another direct customer who comes to you, their  
22 incremental cost is \$900,000 and their savings are the  
23 same, \$600,000, except that they are not having such a  
24 great year and they come to you and convince you that  
25 unless you pay them \$550,000, they are not going to

1       bother doing this.

2                       So, what we get is a net customer  
3       benefit, which I indicated here of \$250,000, and you do  
4       your avoided cost run and again we get a million  
5       dollars. And based on the incremental cost of the  
6       option, the total customer cost test is passed. And  
7       assuming that you are convinced that unless you pay  
8       550,000 you won't get this, you will pay 550,000 to get  
9       the savings; is that correct?

10                      I realize it doesn't sit comfortably,  
11       but...

12                      A. No. I am thinking of the non-profit  
13       housing program where we are actually paying the  
14       900,000, so...

15                      Q. If you could just confirm something  
16       for me. The revenues foregone by Ontario Hydro in this  
17       last example, the \$600,000, the customer gave figures  
18       that will save -- and this is implicit in everything we  
19       have been talking about -- the foregone revenues don't  
20       affect the total customer cost test at all; is that  
21       right?

22                      A. That's right. They are used in the  
23       rate impact tests.

24                      Q. And they also don't affect the  
25       maximum incentive levels that are paid to the



1 participant as you have just said, because if you  
2 netted out the participant's savings from the  
3 incremental cost, you obviously wouldn't be paying the  
4 \$550,000.

5 A. This is exactly where you get into a  
6 program design issue and how you determine what the  
7 incentive levels could be, should be, what it takes to  
8 move the market. Obviously, that interrelationship  
9 between the savings to the customer and the cost to the  
10 customer, that gets right tied into the issue of  
11 payback and where our incentives play with that. So, I  
12 can't make any general rules about that because that's  
13 exactly what I pay my department full of program  
14 designers to do every day. If we could do it with one  
15 general rule, I guess we could do it a little more  
16 efficiently, but I don't think it's that simple.

17 Q. But the overriding general rule, the  
18 total total customer cost test says that if customer B  
19 absolutely won't do this unless you pay them 550,000,  
20 which is \$250,000 more than what you would get if they  
21 netted out their savings or Hydro's lost revenues, you  
22 will pay the 550,00050. That's what the total customer  
23 cost test tells you to do; is that right? You said a  
24 minute ago that you will pay the 550,000.

25 A. The total customer cost test helps us

1 determine what is economic. And the roles that I am  
2 operating on in terms of designing programs is that we  
3 are going after all the economic demand management we  
4 can get.

5 Q. And one of the rules that you are  
6 operating on, one of your mandates is, you do the best  
7 you can with program design, but you are authorized to  
8 pay up to full avoided cost if that's what it takes to  
9 get the measure. So you will pay \$550,000.

10 A. Again, I qualified that, that was a  
11 specific instance, one particular project. It happened  
12 to be fed right from the 150 kV line action, so there  
13 wasn't distribution savings that would accrue to other  
14 similar kinds of projects. It was an important  
15 prototype, to get an early adopter going with that  
16 technology.

17 I wouldn't want to say that that's the  
18 general rule I give my program designers to design a  
19 program by.

20 Q. Certainly, I don't have a problem  
21 with that.

22 In this example you will pay \$550,000; is  
23 that right, in this hypothetical?

24 A. Well, if we wanted to change the  
25 example to non-profit housing program, I would pay

1 \$900,000.

2 Q. So the lost revenues don't at all  
3 affect the incentive level?

4 I shouldn't put it that simply. they  
5 enter into program considerations perhaps, but they  
6 don't affect the bottom line. You will still pay  
7 regardless of --

8 A. They don't effect whether or not it's  
9 economic.

10 Q. And they don't affect the incentive  
11 level that you will pay either if you can't keep it to  
12 that level.

13 I am not being clear. Let me rephrase  
14 it, it will be clear.

15 The incentive level in this hypothetical  
16 isn't limited to \$300,000 because of Hydro's lost  
17 revenues or because of the customer's bill savings, two  
18 sides of the same coin? You are going to pay the  
19 550,000 in this example?

20 A. Again, I will accept that these are  
21 hypothetical programs and they bear not necessarily any  
22 resemblance to programs Hydro has right now with these  
23 kinds of calculations and these types -- this profile  
24 of a project. I wouldn't want to characterize this as  
25 a representative project under one of our programs and

1 this is the incentive, these are the savings.

2 Q. With the example you have told me  
3 about, the non-profit housing where you pay the full  
4 avoided cost, there were --

5 A. No, we don't pay the full avoided  
6 cost there.

7 Q. I'm sorry.

8 A. We pay the full project costs.

9 Q. From a conceptual point of view, the  
10 absolute incentive level would not be limited by the  
11 bill savings to the customer; is that right?

12 A. Again, the reason why we are doing  
13 that non-profit housing is because the costs of the  
14 project would be borne by one group of people, the  
15 benefits would be borne by another, and so because of  
16 that split incentive basis, the customer, i.e., that  
17 pays the bill, doesn't necessarily put the capital up,  
18 and because of those program design considerations,  
19 that then leads us to -- it's not a fact that we can  
20 pay up to full avoided cost. As I said, we are not  
21 paying anywhere near full avoided cost in the  
22 non-profit housing program to pay full project cost.

23 Q. A few minutes ago you told me that  
24 you will pay \$550,000 in this example; is that right?

25 A. Using your hypothetical example, the

1 incentive says \$550,000. So accepting the fact this is  
2 a hypothetical, I guess that's what it says, so I guess  
3 we are going to pay that.

4 Q. And that's in light of the \$600,000  
5 revenue lost/customer bill savings that's on the line  
6 above that. That doesn't change that you are going to  
7 pay \$550,000; right?

8 A. If the hypothetical program you are  
9 talking about is paying whatever, however you design  
10 that incentive, that's what it is. That's what it is.

11 We do not have rules with respect to the  
12 savings. That's right part of the whole issue in terms  
13 of incentive level design, that where those savings do  
14 accrue directly back to, say, the bottom line of the  
15 entity making the investment, we will design our  
16 incentive programs quite a bit different then where  
17 there are situations of split incentives.

18 Q. I take it that that is a qualified  
19 yes. Okay?

20 A. Yes, qualified.

21 Q. Thank you. All right. The last page  
22 of the new exhibit collects all of these examples on  
23 one page. It shows us that Ontario Hydro pays \$400,000  
24 and \$550,000 to customers A and B respectively, each  
25 time to get a million dollars worth of savings for the



1 system, yet the university would provide the same  
2 savings for \$300,000 and Hydro says no.

3 MR. B. CAMPBELL: Mr. Chairman, I know my  
4 friend is putting this as a hypothetical, but I wonder  
5 at some point whether it is really useful to continue  
6 with a hypothetical that is exactly contrary to the  
7 strategic principles that this panel has spoken to with  
8 respect to financial incentives for demand management.  
9 The principles that are the guiding principles --

10 THE CHAIRMAN: Well, perhaps he can ask  
11 the questions to the panel. I don't know whether you  
12 should be introducing now whatever the strategic  
13 principles are. The evidence is there and they can  
14 comment on it if they want, but he has gone through  
15 these examples that he has now collected together and  
16 his question is quite a simple one; that is, at some  
17 point, they are not prepared to pay \$300,000 and at  
18 other points, they are prepared to pay 400 and 550.

19 Now, that question can be asked, I think,  
20 and we can see what the results are.

21 MR. B. CAMPBELL: Well, Mr. Chairman, my  
22 whole objection is that the hypothetical is that Hydro  
23 is prepared to pay. I think these witnesses have made  
24 it clear that Hydro is not prepared to simply use that  
25 decision rule as simplistically as my friend is putting

1 forward. And my objection is simply, I wonder whether  
2 it is useful to pursue this any further given that the  
3 decision rules are not as my friend has stated.

4 THE CHAIRMAN: Well, it is assumed in  
5 these examples that they are prepared to pay those  
6 figures, that they are there. Whether they would or  
7 not in real life may be something else, but they are  
8 prepared to do that in these particular cases.

9 Now, let's now see what the questions are  
10 and what responses we get.

11 MS. FRASER: Sorry, the one that we  
12 haven't talked about yet is the net customer benefit  
13 line and I am not sure how you in customer B, direct  
14 customer B end up with that net -- that doesn't bear  
15 any resemblance to the net customer cost test number  
16 that we have talked about. And I think it may be  
17 misleading because we have used net to be the net total  
18 customer benefit and this is the net with respect to  
19 that particular customer, correct?

20 MR. MONDROW: Q. Well, I haven't asked  
21 you any questions about that, although I will in a  
22 second, and we can certainly clarify any problems that  
23 you are having in a minute.

24 MS. FRASER: A. Yes, okay.

25 Q. The problem that I have with these

1 examples is that in an ideal economy -- I understand  
2 that in an ideal economy where all resources are  
3 perfectly allocated, the efficiency measures in the  
4 university's case are actually more expensive aside  
5 from external benefits and on a purely monetary basis,  
6 then the combustion turbine unit alternative, which is  
7 the derivation of avoided cost, this is what the total  
8 customer cost test tells us, right, a perfect economy,  
9 an ideal allocation of resources?

10 MR. SHALABY: A. You are putting too  
11 many things in one sentence here.

12 Q. Okay, we can slow down.

13 A. The piece about what avoided cost is  
14 based on, I don't think you want to get into that now,  
15 do you?

16 Q. Not if we don't have to.

17 A. We have spent enough time on it and  
18 so let's leave out whether avoided cost is exactly a  
19 combustion turbine unit or something else because it is  
20 a little more complicated than that.

21 Q. Okay.

22 A. The idea of a perfectly efficient  
23 economy, the point is what? The point is?

24 Q. The point is that the total customer  
25 cost test tells us, in the university's case, you

1 shouldn't buy this, Ontario Hydro, because the  
2 incremental cost is greater than your avoided cost.

3 A. That is correct.

4 Q. So in a perfect economy, it is  
5 cheaper for everybody if you build new supply. That is  
6 what the total customer cost test tells us, isn't it?

7 A. The "everybody" is again a  
8 generalization, but for total customer, for all the  
9 customers together, they are better off with the supply  
10 option than with this demand option, yes.

11 Q. Okay.

12 A. Certainly a supplier of this  
13 equipment is not better off with that decision.

14 Q. Okay. I just want to look at the  
15 parties' perspectives for a second. From the  
16 university's perspective in my first example, the  
17 proposed efficiency retrofit pays because they break  
18 even and they do something that they want to do,  
19 something good for the environment.

20 And from Hydro's perspective and so its  
21 customers' perspective, they pay only \$300,000 to get  
22 the same million dollars worth of savings to the  
23 system. But the total customer cost test says that the  
24 university's case doesn't proceed and the other two do.

25 And, Ms. Fraser, perhaps this is where I

1 can clarify the \$250,000. In the case of customer B,  
2 you are paying \$250,000 more than you would to the  
3 university to get the same savings.

4 That is the result of all our discussion,  
5 isn't it?

6 MS. FRASER: A. The savings that you are  
7 talking about, I guess that is the line here 'worth',  
8 and you have indicated that they are all worth a  
9 million dollars.

10 What the total customer cost test tells  
11 you is that if you take all the electricity customers  
12 in the province and determine the net benefit of an  
13 option, or at least three options to them, you can do  
14 that calculation, which, if that is what you mean by  
15 "worth", then your calculations in that line are all  
16 wrong. In fact, the university example, the net  
17 benefit to all the customers of that option is minus  
18 \$100,000.

19 For the customer A project, the net  
20 benefit for all the electricity customers of the  
21 province is zero; and for customer B, the net benefit  
22 for all the customers is \$100,000 plus.

23 Q. I am talking about the benefit to  
24 Ontario Hydro's system. That is what the avoided cost  
25 represents, doesn't it?



1                   A. That is right. That is one element  
2     in the total customer cost test calculation.

3                   Q. And so Ontario Hydro buys a million  
4     dollars worth of benefit to the bulk electrical system  
5     for \$400,000 in the case of customer A and \$550,000 in  
6     the case of customer B, but won't buy it for \$300,000  
7     in the case of the university; is that right?

8                   MR. SHALABY: A. That is right.

9                   Q. Thank you.

10                  A. The objective is not to get away with  
11     the least amount of incentive; the objective is to look  
12     at the total customer test. The way you are putting it  
13     is as if Hydro should go and pursue opportunities that  
14     are the least incentive possible. That is not the  
15     objective.

16                  The objective is to pursue opportunities  
17     that reduce the total customer cost. So even though  
18     there are opportunities that would need little  
19     incentive but they are not economic, that is the point  
20     of the entire example. There are opportunities that  
21     need little incentive, but they aren't economic. We  
22     don't pursue those.

23                  Q. The savings to the system in each of  
24     these three cases is a million dollars; is that right?

25                  A. Yes, but it is a saving to all

1 customers, the system, plus whatever the customers pay  
2 themselves is what we look for, not just the savings to  
3 our system.

4 We are not looking entirely at minimizing  
5 incentive and looking at our avoided cost. We are  
6 looking also at the other side of the equation, what  
7 the customer will incur.

8 Q. And by the customer, you mean--

9 A. The university.

10 Q. --the university.

11 A. --customer A or customer B.

12 Q. Well, the university incurs \$800,000  
13 and it is very happy to do it. I am sorry.

14 MS. FRASER: A. I think what you have  
15 then is an example where the benefits that accrue to  
16 the university are not just energy saving benefits  
17 obviously if they are prepared to do it.

18 This gets back to the example that I used  
19 in the savings by design project, where the window film  
20 required by regulation for aesthetic reasons was more  
21 expensive than the window film offices for one of the  
22 large downtown office towers that would save an amount  
23 of energy. In that calculation, that project did not  
24 pass the total customer cost test.

25 What we did was say there was a certain

1 proportion of that cost that was for aesthetic reasons  
2 that had nothing to do with the cost benefit under the  
3 total customer cost test, and used the proxy of regular  
4 window film which is cost effective under the total  
5 customer cost test and determined that that project was  
6 cost beneficial from that point, from that point of  
7 view.

8 We basically separated the costs and  
9 benefits, so we were only dealing with the costs and  
10 benefits relative to the electricity customers. They  
11 don't necessarily have any -- yes, they don't place a  
12 value on the aesthetics. They may, but they do that  
13 through a whole different process, i.e. through  
14 regulation via City Hall planning guidelines or  
15 whatever, so it happens in a different way.

16 But we don't, as a rule - from a total  
17 customer cost point of view - we can only look at the  
18 costs and benefits relative to the electricity  
19 customers.

20 Now, what you are doing is using the  
21 Ontario Hydro utility cost test as whether something  
22 would be a go or no go and I have indicated that that  
23 is not what we used the Ontario Hydro utility cost test  
24 for.

25 DR. CONNELL: Panel, maybe you can help

1 me understand customer B. Perhaps, Ms. Fraser, if I  
2 could ask, with respect to the incentive stipulated in  
3 this hypothetical example is 550,000.

4 Is it conceivable to you that if in your  
5 program design you came up with a number of, let us  
6 say, 500,000, that customer B would decline to  
7 participate on those terms?

8 MS. FRASER: If this were an industrial  
9 customer and we would be looking at this under our  
10 accelerated payback program, we would essentially  
11 expect the customer to implement this anyway. It is  
12 less than the 1-1/2 year payback, so it would basically  
13 not be eligible for an incentive.

14 That is why it was very important to put  
15 the qualifications around it because this is not how we  
16 would design incentives, using these sorts of mixtures  
17 of energy savings and capital costs.

18 MR. MONDROW: I think, Mr. Chairman, now  
19 would be a good time to take the lunch break.

20 THE CHAIRMAN: All right. We will break  
21 until 2:30.

22 THE REGISTRAR: The hearing will adjourn  
23 until 2:30.

24 ---Luncheon recess at 1:00 p.m.

25 ---On resuming at 2:34 p.m.

1 THE REGISTRAR: Please come to order.

2 This hearing is again in session. Be seated, please.

3 THE CHAIRMAN: We were just remarking

4 that the clock is always fast.

5 Is that everybody's impression or does it  
6 just seem that way?

7 MR. B. CAMPBELL: Nobody is touching this  
8 one. (Laughter)

9 THE CHAIRMAN: I would be very careful,  
10 yes.

11 MR. MONDROW: Mr. Chairman, as it seems  
12 is not uncommon, I may have to revise my time  
13 projections. I might very well go to the end of the  
14 day today, although I will be finished by then.

15 Q. Ms. Fraser, just before the break --  
16 I am going to come back to this once more for a little  
17 bit because I was getting confused as may have been  
18 apparent.

19 MS. FRASER: A. Yes, and I think I  
20 misspoke myself in terms of the payback for customer B.  
21 From the information that is provided here, a simple  
22 payback can't be calculated.

23 Q. I am sorry, could you repeat that?

24 A. From the information that is provided  
25 here, a simple payback on these projects can't be



1 calculated.

2 Q. You mentioned before the break that  
3 what we were talking about at that point was the  
4 utility cost test. I was under the impression that I  
5 was talking about the total customer cost test.

6 Were you talking about the utility cost  
7 test before the break?

8 A. Yes. Insofar as if you were just  
9 taking Ontario Hydro's avoided cost and subtracting  
10 incentives from it, and we have agreed that there's no  
11 program cost involved in this hypothetical, that  
12 essentially is the utility cost test that you are  
13 trying to apply as opposed to the total customer cost  
14 test across these three examples, a variation of it  
15 anyway.

16 Q. When I make the statement --

17 THE CHAIRMAN: I am sorry, I am a little  
18 bit behind you.

19 Why do you say that you can't calculate  
20 the payback from these examples? The payback is, when  
21 do they recover their incremental cost? Is that what  
22 the payback is?

23 MS. FRASER: Well, what is not clear, the  
24 incremental cost of -- if that is the net present value  
25 of the incremental cost -- this is the net present

1 value of the savings, it is not clear what the stream  
2 of the savings are over.

3 THE CHAIRMAN: Oh, I see. It is the cash  
4 flow that you are talking about?

5 MS. FRASER: Yes.

6 THE CHAIRMAN: All right.

7 MS. FRASER: And if you assumed that they  
8 were both on the same basis, in none of these examples  
9 would they ever pay back because the net present value  
10 of the savings is less than the incremental cost in all  
11 cases. So it would never be economic from a customer's  
12 point of view to do any of these things, from "a"  
13 customer point of view, not "the customers'" point of  
14 view.

15 MR. MONDROW: Q. You are telling me now  
16 that in none of these examples would it be worthwhile  
17 for the customer to adopt the option?

18 A. Naturally. If you just take the  
19 incremental cost against the net present value of  
20 savings, assuming that what you are looking at is two  
21 cash flow streams, obviously you are never going to pay  
22 back what your cost was without an incentive.

23 Q. Excuse me just for a minute.

24 If you are saying that none of these  
25 options would be adopted naturally, then I have no

1 problem with that.

2 The point of the hypotheticals was to  
3 determine what incentive rates to be paid for which  
4 options; for instance, with customer A, you are agreed,  
5 I think, that if Hydro pays a \$400,000 incentive,  
6 customer A will adopt the efficiency option; is that  
7 correct?

8 MS. FRASER: A. No. That is what you  
9 said these represented. I had no knowledge whether or  
10 not the customer would adopt these or not. But if you  
11 are just looking at the issue of incremental cost, a  
12 net present value assumed these are streams of either  
13 benefit or cost.

14 Now, if incremental -- like, I am not  
15 clear if this incremental cost is the net present value  
16 of the incremental cost, in which case there is never a  
17 payback on any of these projects.

18 Q. If the incremental --

19 A. This isn't what we would be looking  
20 at in the usual situation. We would be looking at  
21 places where you would end up with -- the payback is  
22 too long and then we bring incentives in. We rarely --  
23 I can't envision a project where we would have a  
24 situation where the incremental cost exceeded the  
25 savings and it still passed the total customer cost

1 test, but I may be...

2 Q. I took you through a hypothetical  
3 here in the case of customer A. The incremental cost  
4 is the cost that the customer would incur now to  
5 install an option. And I am asking you to assume that  
6 the avoided cost that you calculate for that option is  
7 also a million dollars.

8 And I am also asking you to assume that  
9 if we go back to page 3 of the exhibit, the customer  
10 will save in net present value terms \$600,000 on its  
11 electricity bills.

12 And so the customer comes to you and  
13 says, I will do this, I will adopt this option if you  
14 make me whole; will you pay me \$400,000?

15 And I thought we had determined before  
16 lunch that because the option passes the avoided cost,  
17 the total customer cost test, which means that it is,  
18 in my hypothetical, equal to avoided cost, Hydro will  
19 pay the \$400,000 to the customer to get this option  
20 implemented.

21 Am I understanding you correctly?

22 A. In the sense if there were a  
23 hypothetical program that had an incentive designed  
24 this way, if that is what you have presented to us,  
25 yes.

1 Q. Okay. From a conceptual point of  
2 view, this describes the total customer cost test and  
3 how it interacts with proposed options.

4 A. Incentives have nothing to do with  
5 the total customer cost test.

6 Q. Right. The option passes the total  
7 customer cost test and so it is implemented; is that  
8 right?

9 A. If the option passes the total  
10 customer cost test, that is essentially a go or no go  
11 kind of a -- if it doesn't pass, it is not in the  
12 potential, it is not in the program.

13 Q. If customer A had passed the test,  
14 and so it is a go. We have to determine what Hydro  
15 will pay for that.

16 A. Right.

17 Q. And the customer asks for \$400,000.  
18 And my question then is, will Hydro pay the \$400,000 in  
19 this case?

20 A. From the information that you have  
21 given, I can't answer that question relative to our  
22 current program. I am accepting that in the  
23 hypothetical, you have designed a program that pays him  
24 \$400,000.

25 But what I am pointing out to you is in



1 terms of hypothetical examples, a situation where the  
2 incremental cost exceeded the stream of savings, that  
3 means that by the time the piece of machinery or  
4 equipment has burned out before you have got enough  
5 savings to pay for it.

6 Q. Maybe we can clarify this another way  
7 and this was another question I wanted to ask you. You  
8 told Dr. Connell before the break that in the case of  
9 customer B, you would expect self-implementation and  
10 you just mentioned some --

11 A. That is when I said I misspoke myself  
12 in terms of doing this calculation, that I couldn't do  
13 that calculation, so I couldn't make the assumption  
14 that this would be -- As a matter of fact, if what you  
15 have told me now is that these are both on equal  
16 footing, again, there is no payback. The equipment  
17 burns out or dies before the incremental cost is  
18 recovered. So it is not economic just from the total -  
19 never mind the total customer cost test; it is just not  
20 economic from the individual project.

21 [2:44 p.m.] Q. Rather than take up more time here,  
22 I'm going to discuss this with Mr. Diener and, if  
23 necessary, I will come back after the break and ask him  
24 a question.

25 THE CHAIRMAN: Perhaps I could just ask a

1 question with some trepidation. I'm looking at  
2 customer B.

3 MS. FRASER: Yes.

4 THE CHAIRMAN: The incremental cost is  
5 \$900,000, and that's the present value figure in your  
6 view?

7 MS. FRASER: That's what I understood  
8 from --

9 THE CHAIRMAN: And the savings are  
10 \$600,000, and Hydro, let's say, is prepared to pay an  
11 incentive of \$550,000. Will that incentive reduce this  
12 incremental cost?

13 MS. FRASER: Correct. Reduces the  
14 participant's cost.

15 THE CHAIRMAN: The participant's cost.  
16 And therefore would not the savings of \$600,000 present  
17 value at that point exceed then the incremental costs,  
18 after the incentive has been refurbished?

19 MS. FRASER: Oh, yes, at that point, yes.

20 THE CHAIRMAN: And why is then that not  
21 economic, from the customer's point of view?

22 MS. FRASER: I'm only looking at before  
23 the incentive is applied to it.

24 THE CHAIRMAN: Well, I thought we all  
25 agreed -- excuse me, I didn't mean to interrupt, but I

1 thought we all agreed that, absent the incentive, no  
2 customer would do this, and that is one of the  
3 haulmarks of the whole program?

4 MS. FRASER: Absolutely.

5 THE CHAIRMAN: But once the incentive has  
6 been paid, why is it uneconomic for the customer to go  
7 ahead on that basis?

8 MS. FRASER: If you just look at the  
9 piece of equipment and what saving, the stream of  
10 savings, that piece of equipment would be retired  
11 before you'd get your savings out of it.

12 THE CHAIRMAN: The stream of savings are  
13 the \$600,000 projected out over the life of the  
14 equipment. But what was once \$900,000 has become  
15 something less than that.

16 MS. FRASER: True.

17 THE CHAIRMAN: So that would --

18 MS. FRASER: Yes, once we put an  
19 incentive to it, that changes the -- you are using the  
20 participant cost test at that point.

21 THE CHAIRMAN: So once the incentive is  
22 there, then the customer might do this?

23 MS. FRASER: That's right, yes.

24 MR. MONDROW: Q. Isn't that true of all  
25 programs for which incentives are paid? Before the

1 incentive, the customer would likely not undertake the  
2 option, and the reason incentives are paid is to --

3 MS. FRASER: A. Exactly.

4 Q. -- the customer undertake the option.

5 MS. FRASER: A. Exactly. I think all I  
6 was commenting on was the fact that usually you have a  
7 situation on which, you know, the payback, let's say  
8 the incremental cost of something was \$900,000. If the  
9 savings were 300 each year, a simple payback would be  
10 three years. And all you are doing with incentives is  
11 bringing that payback down to a point which crosses the  
12 threshold of the decision maker.

13 Now in this case the payback time is  
14 absolutely infinite, unless I'm missing something.  
15 Basically I don't think there is enough information  
16 here to make a determination about what the incentives  
17 might be under any of our programs.

18 MR. BURKE: A. Maybe just observe that  
19 if for instance there was a piece of equipment that had  
20 a 20-year life, and a \$600,000 --

21 Q. I will interrupt you for a second. I  
22 think I made it clear that I was assuming a three-year  
23 life. I'm not sure if that changes your comment or  
24 not.

25 A. Three-year life, you said that at

1 some point?

2 Q. Yes. Well, If I didn't say that, I  
3 was assuming a three-year life for the option, and all  
4 of these are net present value over three years. I'm  
5 assuming that the option is exhausted after three  
6 years. I apologize if I didn't make that clear.

7 A. I have to agree with Ms. Fraser then.  
8 It definitely wouldn't pay out in the life of the  
9 option.

10 The example is counterintuitive, because  
11 typically the level of rates per kilowatthour is at or  
12 above the avoided cost per kilowatthour. So that you  
13 would expect to see the NPD of savings exceed the  
14 avoided cost in the calculations that you are doing.  
15 To have it the other way around implies a very unusual  
16 load factor for the load being saved.

17 Q. Okay, I'm afraid I'm going to have to  
18 digest this. I will come back to it if appropriate.

19 I'd like to move on then. Ms. Fraser,  
20 you spoke with Mrs. Couban, this is quite awhile ago  
21 now, about demand side bidding systems for procuring  
22 energy savings, and you were talking specifically about  
23 energy service companies. And I believe that your  
24 evidence was that your understanding of the feedback to  
25 date in North America is that bidding systems haven't



1 worked very well, and in fact you mentioned one energy  
2 services company that having gotten through the bidding  
3 system, would never do it again. Could you elaborate  
4 on what the problem is with the bidding systems?

5 MS. FRASER: A. The issue from bidding,  
6 as I point out, our information is based on the  
7 consultant's report that we did towards the end of last  
8 year - I'm just looking for a reference for it - and  
9 that basically indicated that at that time that the  
10 jury was still out in terms of using bidding on demand  
11 side projects. And by demand side projects in this  
12 context, I mean energy efficiency improvements. I'm  
13 not speaking about cogeneration projects.

14 Using that as a mechanism or a proxy for  
15 a level playing field with supply side resources, that  
16 the result of that consultant study was that the jury  
17 was still out, there wasn't enough information in terms  
18 of the actual either responses to bids, or whether or  
19 not the savings had materialized that had been  
20 "contracted for."

21 Subsequently to that research, there were  
22 a number of papers presented at the conference in  
23 Boston, demand side management conference in June of  
24 this year and discussions which ensued in the question  
25 period after that, particularly from two bidders, and

1 discussions I had with them subsequently, certainly  
2 indicated that there was a lot of competition now  
3 evolving between energy service companies and  
4 utilities, rather than co-operation. And that the  
5 intent behind our guaranteed energy performance program  
6 was rather to leverage a cooperative approach as  
7 opposed to a competitive approach to demand side  
8 management. So that was the gist of what I was talking  
9 about with Ms. Couban.

10 Q. Could you explain to me what about  
11 the situation the approach makes a competitive -- makes  
12 for a competitive atmosphere between the utility and  
13 the energy services company? What is it that the  
14 competition is about?

15 A. It is whether or not the program,  
16 their other programs, outside of demand side bidding,  
17 can achieve those savings more cost effectively, and it  
18 gets even more complicated, I think, with respect to  
19 the way in which incentives are being provided to  
20 utilities to participate and develop demand side  
21 programs of any kind. And in some cases, I gather that  
22 they don't get the same credit for the same incentive  
23 for something that has been saved by an energy service  
24 company that they do for their own programs. So they  
25 were saying that competition between them on programs,

1 and sort of the programs cannibalizing each other,  
2 which I don't think necessarily has to be the case at  
3 all.

4 Q. But in the interim, Hydro has  
5 adopted, you have told us, a negotiated approach with  
6 energy services companies.

7 A. Yes, much more of a negotiated  
8 approach. It's called the Guaranteed Energy  
9 Performance Program, and it has a range of incentives  
10 that end up producing a blended incentive rate that we  
11 use to calculate the incentives and pay over the life  
12 of the contract, based on actual energy savings that  
13 have been verified.

14 Q. What element in here is negotiated?

15 A. It is really the blending of the rate  
16 and the kinds of projects that they include in the  
17 contract. Obviously one of the things that we try to  
18 negotiate is to get more, longer-lasting kinds of  
19 savings into the contract, things with longer paybacks,  
20 so that they have expanded their contract beyond the  
21 normal energy service contract, and so that whole  
22 process is a negotiation as opposed to a bid process.

23 Q. So Hydro uses its leverage to get the  
24 energy services companies to kind of expand their  
25 horizons of options that are participating, is that

1 right?

2 A. Exactly, and to expand to the  
3 customers that they intend to target.

4 Q. Thank you.

5 A few weeks ago, Panel, we got Exhibit  
6 258, which introduced fuel switching standards, and if  
7 we can get that out and turn to page 7, I believe, of  
8 that exhibit, we see there a forecast of an additional  
9 1630 megawatts by the year 2000, reduction from peak  
10 demand. And Mr. Wilson, at transcript volume 53, page  
11 9661, you said that Hydro will get this additional --  
12 these additional savings with the assistance of the  
13 government, is that right?

14 MR. WILSON: A. Yes.

15 Q. If the government legislates fuel  
16 switching and amends the Energy Efficiency Act to  
17 enforce higher standards, it seems to me that with all  
18 due respect it is the government that is getting these  
19 additional savings. I appreciate that Hydro is totally  
20 behind them, but don't you think we should be giving  
21 the government credit for these savings, as opposed to  
22 Ontario Hydro?

23 MR. WILSON: A. Oh, I think so too, yes.  
24 We should give the government credit.

25 Q. Thank You. Of course, the important

1        thing is that we do get the addition.

2                    A.    Exactly.

3                    Q.    Table 5 of that exhibit, which is the  
4        next page over from page 7, sets out various cases,  
5        and, Mr. Wilson, you focused much of your evidence on  
6        case C. The way I read the table, Hydro would under  
7        case C be getting 1550 megawatts by the year 2000, is  
8        that right, of EEI?

9                    THE CHAIRMAN: I am sorry, which case was  
10       that, Mr. Mondrow?

11                   MR. MONDROW: Case C in Table 5.

12                   THE CHAIRMAN: Yes. What number did you  
13       say?

14                   MR. MONDROW: I said 1550 megawatts.

15                   Q.    Case C shows a total program driven  
16       EEI improvements of 1010 megawatts, and 540 megawatts  
17       under the program sub-box on that table, and I read  
18       that as being Hydro's contribution to EEI under this  
19       scenario. Is that right, Mr. Wilson, 1550 megawatts?

20                   MR. WILSON: A. Yes, that's right. We  
21       spent some time talking about this table before.

22                   Q.    Yes.

23                   A.    If you have a look at that table and  
24       read across case C, under "Programs" you see there is  
25       540 megawatts for end uses also affected by standards,



1 and that represents the, you know, what we thought we  
2 could accomplish by pushing highly efficient products  
3 between now and 1995, and basically establishing market  
4 conditions that permit the government to adopt the  
5 standards, without causing a huge outcry and major  
6 dislocation of the economy, or basically the electrical  
7 manufacturers and distributors' part of the economy.

8 So although I say the government deserve  
9 credit if they can pull this off, and I really do think  
10 they would deserve credit, it is not really a question  
11 of keeping score. I think that was our point from the  
12 outset. It is a joint effort. If it is not a joint  
13 effort, it won't work.

14 Q. But in terms of Ontario Hydro's  
15 programs, and I realize that what you're talking about  
16 is that much of the field would, under this scenario,  
17 be occupied by the government, but Ontario Hydro's  
18 target for the year 2000 has decreased actually by 450  
19 megawatts, although overall Ontario fares much better,  
20 is that right?

21 A. The portion which is directly fuelled  
22 by incentive payments from Ontario Hydro is decreased.  
23 Now we have talked about incentives taking a variety of  
24 forms, from research to standard support, a whole host  
25 of things which don't involve direct cash payments to

1 customers or to decision makers. And so I would -- I  
2 don't think it is fair to characterize it as an "us and  
3 them" kind of thing. So I really don't accept that.

4 Q. I don't mean to be pejorative, but  
5 I'm just trying to get the numbers for evaluating  
6 Ontario Hydro's programs under this scenario, and  
7 relative to the 2000 by 2000 target, we have come down  
8 a bit beacuse of the other factors now in play in the  
9 marketplace.

10 A. Well, I'd maintain the fact they have  
11 gone up, not down.

12 Q. Okay, thank you.

13 Incidentally, Ms. Fraser, you mentioned a  
14 few weeks ago that with the achievement of demand  
15 management targets, your own remuneration from Ontario  
16 Hydro would be affected. There are incentives within  
17 energy management branch that are tied to achievement  
18 of demand management targets?

19 MS. FRASER: A. All of the sector  
20 managers, myself being manager of commercial,  
21 industrial, residential; directors over that, the  
22 vice-president, plus the vice-president regions branch  
23 and the management through the regions branch that are  
24 responsible for our field staff, share responsibility  
25 for achieving the demand management targets.

1                   My performance contract, for instance for  
2       this year, includes the contribution that I, with the  
3       help of my department, have to make to the achievement  
4       of the targets for commercial. And my performance --  
5       the degree to which I can achieve that performance  
6       contract determines any merit pay that I might get.

7                   Q. I don't want to get too personal  
8       here. Are we talking about a lot of money here, or are  
9       we talking about a token incentive in your estimate?

10                  A. We are talking about small increments  
11       at the top.

12                  Q. Small increments. Okay, thank you.

13                  A. So far we haven't started talking  
14       about decrements, so...

15                  Q. I'd like to move to a new area,  
16       please, Panel. I want to talk about demand discount  
17       service. If you could turn up Interrogatory 2.14.101,  
18       the response to that interrogatory.

19                  MS. HARPER: A. Yes.

20                  Q. Mr. Harper, this is your area.

21                  A. Yes.

22                  THE CHAIRMAN: Do we have those, Mr.  
23       Lucas?

24                  MR. MONDROW: These are the  
25       interrogatories from --

1 THE REGISTRAR: I am sorry?

2 THE CHAIRMAN: They were not an exhibit.  
3 They were put up as part of the material.

4 MR. MONDROW: I do have a package. I had  
5 advised Ms. Morrison which interrogatories I would be  
6 referring to, but I have some packages, if it would  
7 help.

8 THE CHAIRMAN: All right.

9 MR. MONDROW: I guess then, Mr. Chairman,  
10 this should get a number, this interrogatory?

11 THE CHAIRMAN: This interrogatory should  
12 get 260 --

13 THE REGISTRAR: 261.57.

14 THE CHAIRMAN: 12.14.101.

15 ---EXHIBIT NO. 261.57: Interrogatory No. 12.14.101.

16 MR. MONDROW: Q. Okay, in response to  
17 this interrogatory, Mr. Harper, we received a paper  
18 entitled "Replacement of Capacity Interruptible Power  
19 with Discount Demand Service." I will refer to  
20 discount demand service as DDS for ease.

21 MR. HARPER: A. That's fine.

22 Q. So the DDS program is another form of  
23 capacity interruptible load. It is an interruptible  
24 program, is that right?

25 A. Yes.

1                   Q. I just want to quickly go through my  
2 understanding of the interruptibles concept. It is my  
3 understanding that interruptibles allow Ontario Hydro  
4 to cut power up to a maximum duration and a maximum  
5 amount of energy at any given time upon notification to  
6 the customer, the interruptible customer. And this  
7 provides relief to the system under what are termed  
8 emergency conditions. And we see that term set out at  
9 the first page of the executive summary to this paper,  
10 which is after the prefix in the table of contents, the  
11 last sentence of the first paragraph.

12                   So in essence anytime Hydro has to dip  
13 into its 24 per cent reserve margin, we have a  
14 potential emergency condition, is that right?

15 [3:04 p.m.] MR. HARPER: A. It's not really when we  
16 have to have to dip into the 24 per cent. Essentially  
17 these customers are served to a large extent out of  
18 that 24 per cent reserve margin. When reserves get  
19 even tighter still to the point where firm service is  
20 at risk, that's when these customers are interrupted.

21                   Q. So, the service that these customers  
22 get on a fairly regular basis, the interruptions are  
23 for short durations and at certain times, other than  
24 that they are getting power. Are you saying that the  
25 power that they are getting is conceptually coming out



1 of that 24 per cent reserve space that the system uses?

2 A. Yes. I think conceptually in a  
3 fairly simplistic way, that's the easy easiest way to  
4 look at it, is that if you didn't plan a system with  
5 any reserves and firm power was always at the point of  
6 capacity, then there would be no room at all.

7 Q. So, in an emergency condition then,  
8 cutting these customers, in essence, is kind of a  
9 floating buffer, it brings the system back up to a  
10 level that the operators are comfortable with?

11 A. Yes.

12 Q. If you will allow me to again  
13 conceptualize for a minute. It seems that purchasing  
14 DDS is like purchasing insurance against the  
15 availability of electricity. You have interruptibles  
16 in the wings and you pay them, you get a discount,  
17 rather, on their bills - and I will go into the  
18 specifics of that in a minute - and in exchange for  
19 that fee you know that when the demand hits a critical  
20 level you can cut them back and the system will go on  
21 operating as it should. It's kind of an insurance; is  
22 that fair, do you think?

23 A. I don't know whether I would  
24 characterize it as insurance.

25 Really what you have done is, instead of

1 having them as firm customers and having to build  
2 capacity for them, they are interruptible and therefore  
3 you don't have to build that capacity and put it in  
4 place for them. It's therefore on an ongoing basis  
5 there is a savings accruing to the system because you  
6 have not had to put that load into your planning  
7 requirements and build capacity to meet it. So, I  
8 don't view it as an insurance program.

9 Q. Well, Hydro knows that it can always  
10 cut those customers if it has a problem; is that right?

11 A. Yes.

12 Q. And in exchange for that ability  
13 Hydro pays something to those customers--

14 A. Yes.

15 Q. --or those customers save something  
16 on their bills. So, Hydro is, in effect, buying --

17 A. We are essentially buying capacity.

18 Q. But capacity only when Hydro is in an  
19 emergency situation, not capacity that you use all the  
20 time; is that right?

21 A. Maybe Mr. Shalaby is probably better  
22 at this than I am, but we don't use all our capacity  
23 all the time anyways. It's only during peak periods  
24 and in emergency conditions that we would actually be  
25 using all the capacity on the system anyway.

1 Q. Is there a maximum amount of  
2 interruptibles contracted that's useful to the system?

3 MR. SHALABY: A. I think we answered an  
4 interrogatory to that effect. My recollection is that  
5 we said that there is no theoretical reason why you  
6 wouldn't have more and more interruptible, but there  
7 are practical limits to it.

8 Q. But practically, considering the  
9 state we are in now, we can use a lot more  
10 interruptibles, at least in the order of several  
11 thousand megawatts of interruptibles, if everything  
12 else being equal; is that fair?

13 A. Their utility, their value  
14 diminishes. The more you take on, the less value it  
15 will become, because you can only interrupt them for a  
16 limited period of time.

17 In the extreme you cannot have a system  
18 that has no generation and a lot of interruptible  
19 customers. So, the extreme gets very silly.

20 Q. We don't have interruptibles  
21 contracted up to the 24 per cent reserve margin that  
22 Hydro has told us you operate with; is that right? The  
23 number of megawatts contracted as interruptible now is  
24 significantly less than that figure, that 24 per cent?

25 A. It is less than 24 per cent, yes.

1 Q. So there is a lot more room. We  
2 could use more interruptibles.

3 I understand what you are saying, that at  
4 the extremes the picture changes, but from where we are  
5 at now, if we could get a few thousand more megawatts  
6 of interruptibles, it would be a benefit to the system,  
7 everything else being equal; is that fair?

8 A. There will be a benefit, yes, anybody  
9 who is willing to sign up--

10 Q. Should come and see you.

11 A. --to be interrupted when we are in  
12 trouble is a benefit. But that benefit is reduced the  
13 more contracts you sign up.

14 Q. Fine. Thanks.

15 At page 1 of the paper, and this is now  
16 page No. 1, there is a heading "Recent Status" and  
17 there is a description in that section about problems  
18 that Ontario Hydro has been having, apparently  
19 following a high point of interruptions to  
20 interruptible customers there have been a lot of  
21 defections, a lot of defections from this service.

22 Now, when an interruptible gives you  
23 notice that they want to convert to firm service from  
24 interruptible service, they actually remain  
25 interruptible for two years and then they become

1 something called quasi firm for another three years; is  
2 that right?

3 MR. HARPER: A. That's correct.

4 Q. And the 5-year notice period I guess  
5 gives Hydro time to readjust the system and make the  
6 operating decisions and the capacity, I guess, addition  
7 decisions that it feels it has to; is that right? It's  
8 a lead time?

9 A. That's correct. The idea of the  
10 5-year period is to allow the Hydro planners and  
11 operators time to readjust their plans accordingly.

12 Q. And when a customer is classified as  
13 quasi firm, it means that they can still be cut and  
14 they can still get an energy credit when actually cut,  
15 which is the amount that they get paid when their power  
16 is interrupted on a per kilowatthour basis. But they  
17 don't get a monthly discount in their peak demand, in  
18 their bill for the peak demand for that month, which is  
19 the other part of the rate structure; is that right?

20 So they get half the rate structure, they  
21 get the energy credit but they don't get the monthly  
22 demand discount anymore for that last three years?

23 A. Yes.

24 Q. Is this in effect -- I know it's not  
25 intended this way, but the effect it seems is a penalty



1 for converting off of interruptible service. Someone  
2 who has decided to convert off not only has all the  
3 obligations but gets only part of the benefits of the  
4 service?

5 A. I wouldn't say they have all the  
6 obligations. There are a number of control or action  
7 items that power system operators take when the system  
8 starts to become capacity or energy deficient. And  
9 really what happens is that at a certain point in time  
10 they decide they are going to have to cut interruptible  
11 customers.

12 There are a number of other control  
13 actions that they take after that before they would cut  
14 the quasi firm customers.

15 So, there is a very distinct difference  
16 between those customers in terms of where they come in  
17 the pecking order of being cut. So the odds of being  
18 cut when you are quasi firm are quite a bit less than  
19 when you are just an interruptible customer.

20 I guess we have a great time coming up  
21 with names, quasi firm, quasi interruptible, but they  
22 are not a fully interruptible customer and so therefore  
23 they don't get the benefit of being interruptible in  
24 terms of the discount and the rebate.

25 Q. And so the decrease in obligations in

1 Ontario Hydro's estimate is roughly commensurate with  
2 the decreased benefits that this quasi firm customer  
3 gets for those three years?

4 A. I don't know if it's exactly  
5 commensurate. I think it is more a matter that we were  
6 trying to acknowledge that they were getting service  
7 that was somewhat more firm than the interruptible  
8 customers and therefore they shouldn't be getting the  
9 same level of rate discount. And this particular  
10 mechanism that we used was a fairly easy one because  
11 there is a two-part rate and you can pay one part but  
12 not the other.

13 Q. From the perspective of a customer who  
14 is considering going on to interruptible service, would  
15 this potential, if the customer changes it's mind of  
16 three years with a lot of the obligations, though not  
17 all as you have explained, and not all of the benefits,  
18 do you think that would be a disincentive for that  
19 potential interruptible customer?

20 A. No, I don't believe so. We actually,  
21 in coming up with this particular form of service, we  
22 had some discussions with actual interruptible  
23 customers to find out what they perceived as being fair  
24 from their perspective, or what they saw as being more  
25 preferable. And from their point of view this option

1 of becoming quasi firm and only getting the energy  
2 credit after two years was preferable to, say, to being  
3 maintained on interruptible power for the full five  
4 years with the full discount. From our perspective, it  
5 gave our firm customers exactly the same protection as  
6 if they had remained interruptible.

7 Q. Thank you. And the second paragraph  
8 under the heading "Recent Status" there is some figures  
9 given, and I have down a quick calculation. I will  
10 just ask you to confirm the range here. It seems that  
11 there is about between, I guess it was 1988, and the  
12 projection for January 1991 contained in the paper,  
13 there is about a 62 per cent decrease. It's over three  
14 years in the total interruptible contracts in terms of  
15 megawatts. Is that roughly about right, 62 per cent,  
16 60 per cent?

17 A. How did you come up with the 62 per  
18 cent?

19 Q. Sure, I can explain it.

20 It says there in the second paragraph,  
21 and I assume this runs from 1988, it says within the  
22 next few months customers requested to convert 143.7  
23 megawatts, and that at that time was 12 per cent of the  
24 total contracts, and just by doing the reverse  
25 calculation there.

1                   A. Yes, I think you're right. That's  
2                   right. Something in that order. If you take the 143  
3                   divide in the 82.5 and then acknowledge what has taken  
4                   place through 1990, which is the 187 megawatts, I will  
5                   accept your arithmetic. When you sum those up and  
6                   divide by the contract, it's probably in the order of  
7                   20/30 per cent.

8                   Q. Thank you. Just for the benefit of  
9                   the reader, or the listeners, there is the figure given  
10                  at the bottom of that paragraph, projections for  
11                  January 1991 and it says 991 megawatts expected at that  
12                  time, January 1991. So that's the basis of the figure,  
13                  the range of which you have just confirmed for me?

14                 A. Not entirely, no. Because if you  
15                 recall our earlier conversation, the customers have to  
16                 give a two-year notice. So, as noted in the text here,  
17                 187.4 megawatts of contracted interruptible load to  
18                 date that had been requested for conversion in 1990,  
19                 that would still be interruptible in 1991. It would  
20                 not be until two years after the notice date that the  
21                 action became quasi firm.

22                 Q. Right. There is a lag.

23                 A. There is a lag. So given the notice  
24                 we received and accounting for the lag and not all  
25                 those notices will have translated into people actually

1 being off of interruptible service as at January 1991,  
2 that's how you have come with the 991 megawatts.

3 Q. Right. But there are significant  
4 percentages of the customers on their way out from  
5 this?

6 A. Yes. I think that's shown if you  
7 read the last sentence of that second paragraph there  
8 by the fact of the 250 megawatts of notices of  
9 conversions still outstanding.

10 Q. Right. Okay. Thank you.

11 it's important then, if possible, to get  
12 the contracted amount of interruptibles back up. In  
13 fact, in HR18, the Ontario Energy Board recommended  
14 that Hydro revisit the question of interruptibles and  
15 change the program, and I think they said something to  
16 the effect of paying a level more commensurate with  
17 system benefits. They were interested in getting more  
18 interruptibles and we see that this DDS proposal is the  
19 result of that Ontario Energy Board concern, and the  
20 aim of this proposal is to in fact shape up in that  
21 area, to try to get more interruptibles and more  
22 benefit for the system; is that fair?

23 A. It's fair except in the sense I think  
24 it's a concern not only to the Ontario Energy Board but  
25 also of Ontario Hydro itself.



1 Q. Certainly, certainly.

2 Okay, I want to talk about the rate  
3 structure for a couple of minutes. It's something that  
4 we spoke about very superficially a second ago.

5 If we start at page 15 of this paper  
6 there is a description of the DDS rate structure. It  
7 seems to me there are two basic concepts to the benefit  
8 to the system of interruptibles. There are capital  
9 costs that are avoided due to the interruptibles. You  
10 mentioned a minute ago that you don't have to build  
11 capacity for the block of demand that is interruptible,  
12 and then the second aspect is that there are operating  
13 cost savings when the customers are in fact  
14 interrupted; is that conceptually right?

15 A. Yes, that would be correct, if you  
16 think of it in the context if you had had to build a  
17 particular facility, then you would actually have to  
18 operate it at certain points in time during the year,  
19 and so you would actually incur those operating costs  
20 as well as the capital costs associated with that  
21 facility.

22 Q. And conceptually matching the savings  
23 with the rate structure - and there are qualifications  
24 which is we will talk about in a minute - but there are  
25 two ways that savings to the system translate into a

1 .- rate structure under the DDS format. There is a demand  
2 discount which is a reduced demand charge on the peak  
3 interruptible capacity used in a given month of the  
4 interruptible customer. That interruptible customer  
5 gets a discount every month because it's interruptible.  
6 And on top of that, when power is in fact interrupted  
7 the customer gets what is termed as an energy credit, a  
8 per kilowatthour payment for the kilowatthours  
9 interrupted; is that right?

10 A. Yes.

11 Q. And on page 16 of the paper, there  
12 are three alternative rates for DDS given in Table 7.  
13 The first alternative headed up with the numeral A,  
14 there is a 1.96 cent per kilowatthour energy credit.  
15 Is this figure of the order of the actual operating  
16 savings that Ontario Hydro experiences when a customer  
17 is interrupted?

18 A. It's an estimate of what the net  
19 operating savings would be. And when I say "net", I  
20 mean the difference between the fueling or operating  
21 costs of the unit and the revenues that you would have  
22 received from that customer if you actually had to  
23 serve him, which you are not receiving now.

24 Q. Okay. Now, the rate structure that  
25 Ontario Hydro has actually chosen for the DDS program

1 credits a large part of the avoided capital cost that  
2 we spoke of a second ago to the demand discount, which  
3 is given up front to the customer, but it also combines  
4 part of these avoided capital costs into the energy  
5 credit, so the energy credit pays something more than  
6 the savings, the net operating savings that Hydro  
7 experiences when the customer is interrupted; is that  
8 right?

9 A. Yes, that's correct.

10 Q. And the value assigned to the energy  
11 credit is 10 cents a kilowatthour; is that right?

12 A. Yes, that is correct.

13 Q. You can see that.

14 On page 16, again in the second last  
15 paragraph, we see the rationale for this choice and  
16 there are two rationales given. It shares the risk  
17 associated with forecasting the hours of interruption  
18 in a given year between the customer and Ontario Hydro,  
19 and it positions interruptibles as a dispatchable  
20 resource. Am I reading that correctly?

21 A. Yes. I think the third reason we  
22 also had in mind was trying to acknowledge and  
23 recognize the fact that when we cut customers, that's  
24 when they actually incur or most likely incur most of  
25 the costs. They either have to stop production and

1       lose production and send people home, or sometimes what  
2       happens is they don't up finishing the product, it  
3       isn't such a refined product as it used to be before  
4       and they have to sell it in a more raw form and they  
5       don't make the same markup or value added on it. It's  
6       trying to recognize it's really when we cut the  
7       customers is when they experience the inconvenience and  
8       when they experience the costs, and to some extent this  
9       better helps match the form of the rate we are giving  
10      them with the nature of the cost that they are  
11      incurring.

12                   Q. Okay. On the dispatchability point  
13      for a second. Does this, in effect, set up 10 cents a  
14      kilowatthour as a cap on what Ontario Hydro will have  
15      to pay for alternative sources of emergency power, like  
16      purchases, for example? Is that what the  
17      dispatchability is all about?

18                   A. It could, in a sense, yes. To the  
19      extent that if you were to say I can either cut  
20      interruptible customers and pay them a rebate of 10  
21      cents a kilowatthour, or alternatively, if it's  
22      available and if I can find a source of purchase power  
23      that's available for, say, 8 cents a kilowatthour, it  
24      would be a more economic decision on the part of the  
25      power system operators to purchase that power.

1                   The thing with interruptible is, it's  
2           either, (A), that economic power is not there at an  
3           economic price, or, (B), it's not there all; you still  
4           have the option of cutting those customers.

5                   Q. So, would it be fair to say that this  
6           is, in effect, another kind of insurance, insurance  
7           against the maximum that Hydro will have to pay in an  
8           emergency situation to bring the system back up to a  
9           comfortable operating level?

10                  A. Again, I am struggling a bit with the  
11           term "insurance". I think it again gives our operators  
12           some more economic options to look at when they are  
13           trying to figure out how best to meet that particular  
14           emergency situation.

15                  Q. Okay. You are paying the  
16           interruptibles a monthly demand discount, and the rest  
17           of the value of the interruptibles to the system is  
18           rolled into the energy credit, and you will never have  
19           to pay then up to the amount of interruptibles you have  
20           contracted more than 10 cents a kilowatthour hour for  
21           emergency relief; is that fair?

22                  A. If I understood your question  
23           correctly, we pay the interruptibles 10 cents a  
24           kilowatthour on the estimated relief they provide us  
25           for. It's never more, it's never less. It's 10 cents



1 a kilowatthour.

2 Q. Right. But if purchases are, from  
3 an interconnected utility, for example, it would be  
4 cheaper in an emergency situation, less than 10 cents a  
5 kilowatthour, you would opt for the purchases?

6 A. Yes.

7 Q. So, the 10 cents is, in effect, a cap  
8 on what you are going to have to pay up to the number  
9 of interruptibles that you have for emergency power?

10 A. Yes. It provides an indicator in  
11 that sense in terms of what is economic to consider in  
12 terms -- in an emergency situation, that's right.

13 Q. There is no reason why dispatch  
14 evaluation has to be tied to the rate structure, is  
15 there? You could have one criteria for dispatch of  
16 interruptibles and still have a rate structure that  
17 doesn't reflect that precise criteria; isn't that so?

18 A. I assume you could. Like I said,  
19 this approach is taken because it dispatches in this  
20 context the most economic resource available.

21 Q. I asked the question because on page  
22 16, the third last paragraph, we are told that there  
23 are at least two kinds of customers. Some customers  
24 prefer their savings up front. In fact, this paper  
25 says that the majority of Ontario-based customers would

1 prefer that, which would be a higher demand discount  
2 and a lower energy credit.

3 [3:24 p.m.] But as you have said a few minutes ago,  
4 there are, of course, customers who would prefer to  
5 match their electricity savings with periods of revenue  
6 loss because of the interruption.

7 So, there is more than one aim of  
8 interruptible customers. They fall into more than one  
9 category in terms of what rate structure would best  
10 serve them; is that fair?

11 A. Yes, I think it is.

12 Q. And if you didn't tie the setting of  
13 the energy credit to the dispatch model, you could  
14 offer a spectrum of interruptible rates. You could  
15 offer one with a 10 cent per kilowatthour energy credit  
16 and you could offer one with a 1.96 cent per  
17 kilowatthour energy credit and you could offer probably  
18 a number of options in between.

19 Wouldn't that increase customer  
20 satisfaction and the level of interruptibles that the  
21 system is able to contract?

22 A. Yes, it would. I think you would  
23 have to take some care if you did that in terms of how  
24 you allowed customers to move back and forth between  
25 the options because a customer's perception of a value

1 of a certain option is going to depend on how  
2 frequently or how often he thinks he is going to get  
3 cut during a year.

4 If you think of him being in for a 5-year  
5 period, if that perception starts to change, and  
6 probably most customers' perceptions would change in  
7 the same direction, you would want to make sure that  
8 customers weren't all moving to one particular option  
9 which was going to end up costing the system more.

10 This is struck on an average basis. I  
11 think as long as everybody is in at one point on the  
12 average, you are fine. If you find that the system is  
13 starting to move away from the average and you allow  
14 everybody to move to one particular option, then I  
15 think I would be concerned about in the end actually  
16 paying out more than our total avoided cost.

17 Q. Well, there are customers for whom  
18 the 10 cent energy credit is ideal. That is why you  
19 have adopted it, I assume; is that right?

20 A. There are customers for whom the 10  
21 cent energy credit is preferable, yes.

22 Q. It is preferable. And there are  
23 customers for whom a 1.96 cent energy credit would be  
24 preferable and they won't opt for DDS because they are  
25 not getting their money up front.

1                   A. I don't know if they won't opt for  
2       DDS. In total, they may prefer one to the other. They  
3       may find that the options we are offering are  
4       preferable to being a firm customer.

5                   So I must admit since going out in the  
6       field and offering this particular rate form to  
7       customers, we haven't received any feedback from  
8       customers that, gee whiz, we really liked it more the  
9       old way when you were paying it all on the discount and  
10      not on the energy credit and why don't you go back and  
11      offer that as well. We haven't received any comments  
12      from customers to that extent.

13                  Q. Have you solicited comments to that  
14      extent? Have you done a survey of what customers would  
15      prefer?

16                  A. No, we haven't, but in terms of going  
17      to the service, we have been actually actively out and  
18      speaking to each of the customers individually and  
19      transferring them over from the old process to the new  
20      process in terms of explaining the terms and conditions  
21      to them and new rates to them. So there has been  
22      direct contact with each of the customers.

23                  Q. Do you not think that if you offered  
24      more than one rate structure, you would get more  
25      interruptibles?

1 A. Theoretically, you might, yes.

2 Q. Hydro is not considering offering  
3 more than one DDS rate structure; is that right?

4 A. Not at this particular point in time,  
5 no. I think as I said, we have been mainly working on  
6 getting customers transferred over to, one, not only  
7 the new rate structure, but making sure they understand  
8 the new terms and conditions. We expanded our  
9 definition of winter and expanded the number of hours  
10 we can cut them for in both the winter and the summer.

11 And that, from talking to the customers  
12 is probably the more important thing to make sure they  
13 understand because those are the terms and conditions  
14 they have to follow within the contract.

15 I think perhaps once we get all the  
16 customers moved over, we can look at finetuning this  
17 particular offering, but it is not something that we  
18 are doing any work on at this particular point in time.

19 Q. Well, if you had come out, for  
20 instance, with two options, could you not have saved  
21 money by explaining to the customers both options at  
22 the same time and asking them to make their choice and  
23 maybe gotten more customers along the way? Is that  
24 something that Hydro considered doing?

25 A. No, we didn't consider doing it. We



1 have three options we are offering customers at this  
2 particular point in time as it is.

3 What we have been talking here, if you  
4 will notice on page 16, is really just option No. 1.  
5 There are three options in total. And I guess part of  
6 our concern was both from our own internal  
7 administrative purposes and talking to the customers to  
8 make sure we didn't have a plethora of options and  
9 overly confuse the issue to begin with.

10 Q. All three of those options set the  
11 energy credit at 10 cents a kilowatthour?

12 A. Yes, that is correct.

13 Q. So none of your options would involve  
14 any other energy credit that might satisfy customers  
15 more as you have indicated in that paragraph, third  
16 from the bottom on page 16. There are different  
17 customers with different requirements.

18 A. Yes.

19 Q. Okay. Thank you. I have one more  
20 question on DDS, one more area.

21 I assume that the 10 per cent preference  
22 premium that covers all of these benefits of  
23 alternatives to new supply is also part and parcel of  
24 the DDS evaluation in rate structure; is that right?

25 A. No, it is not. It was not included

1 when we did the evaluation of the discount demand  
2 service rates. So, when we say it is based roughly on  
3 90 per cent of avoided cost, that is the avoided cost  
4 without the preference premium.

5 Q. Is DDS not a preferred option to  
6 building additional capacity?

7 A. I view it is, yes.

8 Q. But the 10 per cent preference for  
9 identifying and harvesting options that are better than  
10 building capacity wasn't applied in the DDS analysis?

11 A. No, it was not.

12 Q. Was there a reason for that?

13 A. I guess the main reason in my mind is  
14 the fact that we are paying 90 per cent of avoided  
15 costs as it is, so we are pretty close up to the full  
16 avoided cost.

17 In terms of structuring this program, I  
18 think I raised this point when I was talking with Mr.  
19 Rodger from AMPCO, was to try and make sure that not  
20 only were we paying in line with avoided cost, but that  
21 it was a program that would benefit both the  
22 interruptible customers and the firm customers on the  
23 system.

24 And since it is the straight avoided cost  
25 that is reflective of what is the actual cost that

1 those customers pay, paying 90 per cent of that still  
2 means that they are better off.

3 If you were to pay 90 per cent with the  
4 premium, you would essentially be paying 100 per cent  
5 and they would be breaking even.

6 So, I don't know, if somebody had come to  
7 me and said you should use the premium cost, I might  
8 have said, well, in that case, maybe it should be 80/85  
9 per cent. But I think we had that other objective in  
10 mind as well in terms of making sure that not only  
11 these customers received a benefit but also the other  
12 customers in the program received -- the other  
13 customers on the system, excuse me, the firm customers,  
14 received a benefit as well.

15 Q. Let me just clarify something here.  
16 You are referring to paying 90 per cent of avoided  
17 costs and I understand that page Roman numeral 2 of the  
18 executive summary, Item 3, in fact, says that 10 per  
19 cent of the value of the interruptible loads is held  
20 back, it is not paid out, in DDS rates. There are  
21 three reasons given for that. One of them is one you  
22 just alluded to, to provide some benefit to firm  
23 customers.

24 First of all, I guess I want to confirm,  
25 I am reading benefit to firm customers to mean

1 financial benefit.

2 A. Yes, rates that are lower.

3 Q. I guess I am having trouble  
4 understanding why firm customers should get a financial  
5 benefit at the expense of the DDS participants when  
6 they are, in fact, not incurring any of the risks or  
7 the obligations.

8 A. I guess from my perspective for those  
9 firm customers, one, the program is an optional  
10 program. The interruptible customers, they can choose  
11 to participate or not choose to participate. But I  
12 think it is pretty clear, given the terms and  
13 conditions we have right now, not all customers can  
14 participate.

15 If you have to bring a minimum of 2-1/2  
16 megawatts of relief to the system, I think clearly,  
17 small residential and commercial customers can't  
18 participate.

19 So to that extent, they are saying, I  
20 have absolutely no opportunity to participate in the  
21 program. What is the benefit of Hydro offering that  
22 from my perspective? The benefit is that Hydro does  
23 not have to build capacity it would otherwise have to  
24 put in place to meet those interruptible loads.

25 Q. And that is a benefit to the

1 customer --

2 A. Yes, but then you say, we are paying  
3 out the majority of that benefit to those interruptible  
4 customers. And if you are to pay 100 per cent of it  
5 out, then those customers, they would be indifferent,  
6 except for as we noted here, the administration costs  
7 and other costs involved in the program.

8 Q. So, you think that by paying out the  
9 full 100 per cent, you wouldn't get more DDS than you  
10 have now, as opposed to paying out the 90 per cent?

11 A. I think conceptually, you might get  
12 more. I don't think the change in the numbers would  
13 get you a material amount of it, additional response.

14 This is something we had some discussion  
15 with at the OEB when we were talking about it, when we  
16 were talking about actually implementing the particular  
17 rate structure.

18 Q. Do you have any analysis of that?

19 A. No, we don't.

20 Q. Is this some version of the no-losers  
21 test that Ontario Hydro is supposed to have abandoned  
22 for program purposes, making sure that non-participants  
23 get some benefit?

24 A. I guess from a rate perspective, yes.

25 Q. So that test hasn't been abandoned in



1 the case of DDS, has it?

2 A. Well, I think the difference is not  
3 that great between paying out 90 per cent and 100 per  
4 cent. Paying out 90 per cent of avoided cost, we are  
5 probably paying out substantially more than we are in  
6 virtually any of the other demand management programs.

7 Q. But there has been no analysis on  
8 that. You told us that. It is your opinion that it  
9 wouldn't make a big difference.

10 A. That's right.

11 Q. There is another reason given for  
12 holding back 10 per cent. You say that you hold back  
13 10 per cent in part to cover uncertainties in the  
14 derivation of avoided costs.

15 I am not familiar with this point in any  
16 other demand management program. Is this the only  
17 place that money is held back, to cover uncertainties  
18 in the derivation of avoided cost?

19 A. I am not too sure where else it is  
20 held back and I think there may be an issue in terms of  
21 how closely you are approximating avoided costs. If  
22 you are only paying out 50 per cent of avoided costs,  
23 it may not be an issue.

24 There are two points here I would like to  
25 raise: One is that in working out what the fueling

1 costs were, we were essentially trying to work out what  
2 would be the natural gas costs involved in fueling this  
3 natural gas-fired CTU. Now, essentially, we haven't  
4 got any commitments for natural gas or any contracts  
5 for natural gas, so there is some uncertainty involved  
6 in terms of what those prices are.

7 The other point is, is we are actually  
8 setting a rate here, a rate that you are going to be  
9 charging customers. And rates are something that you  
10 like to see some sort of element of stability from year  
11 to year.

12 I think even over the course of the two  
13 years that we have been looking at this, the avoided  
14 costs changed slightly between how we finalized our  
15 1991 rates and how we went to develop our 1992 rates,  
16 to the extent that whereby actually, just holding our  
17 rates at the 1991 levels, we will now be paying out  
18 probably 92 per cent of avoided costs in 1992.

19 So, if we had marched on 100 per cent  
20 exactly in 1991, we probably actually would have to  
21 drop those rates a little bit in 1992 in order to stay  
22 within the avoided cost ceiling which, in my mind, we  
23 would be giving the wrong signals to customers.  
24 Leaving that little bit of head room allows us some  
25 flexibility if the avoided cost that we used to

1 evaluate and calculate the rate change a bit from year  
2 to year.

3 This is precisely the problem I was  
4 talking about in my direct when I was talking about  
5 using marginal cost to set rates in the sense that they  
6 tend to be rather volatile from one year to the next.  
7 And if you are trying to set rates which you want to  
8 have some element of stability to, you have got a  
9 conflict there.

10 Q. And what if avoided cost is too low?  
11 You are not compensating for that. You are just  
12 compensating if avoided cost is too high, right? You  
13 are holding some back. But you could err on either  
14 side; isn't that right?

15 A. Yes, the avoided costs could go up.  
16 I think the problem is, from the customer's perspective  
17 in terms of the signals you are telling him through the  
18 rate, there is probably a lot of difference between  
19 increasing the rate a year after you have introduced  
20 this new rate form and actually dropping the rate a  
21 year after you have introduced this new rate form. You  
22 introduced a new rate form, you convince them all to  
23 sign up and you turn around ten months later and you  
24 drop the rate on them, they say, "Well, what are you  
25 doing to us?"

1 Q. Well, we have heard that you don't  
2 apply the 10 per cent preference premium to this. And  
3 further, you now cut back - you hold 10 per cent back  
4 and part of it has to do with avoided cost uncertainty.  
5 And yet you have said this is a preferred option.

6 So, wouldn't an option be to not worry so  
7 much about cutting the rates back a cent or two and  
8 just set them at avoided cost? You are not even adding  
9 the 10 per cent and leave them there.

10 MR. WILSON: A. Could I offer sort of a  
11 comment on this?

12 The size of sort of the share the  
13 participating customer gets on DDS rates is akin to an  
14 incentive given to a customer on one of the demand  
15 management programs.

16 We have already testified that we don't  
17 pay 100 per cent of avoided cost as incentives. In  
18 fact, I guess the DDS program participants get a bigger  
19 incentive as a fraction of the avoided cost than any of  
20 the other programs participants, so it is probably the  
21 most generous program in the current portfolio.

22 You asked a question about the 10 per  
23 cent premium matter and I guess Mr. Harper wasn't  
24 thinking of this aspect of it, but we don't offer that  
25 incentive -- oh, pardon me, we don't calculate that

1 adder and apply it to load shifting programs. We are  
2 simply - we are shifting energy consumption from one  
3 time to another where there is some saving on energy.

4 I believe that DDS customers, when they  
5 are interrupted for a few hours, don't go to their  
6 order book and tear up the orders and say, well, I  
7 guess we can't make that steel or those shoes, or  
8 whatever it is they do. They make them up on another  
9 shift and they consume the energy later. So, it is  
10 very much akin to the load shifting and it is quite a  
11 consistent treatment.

12 MR. MONDROW: I am sorry, I have run a  
13 bit late. Perhaps we should take the break, Mr.  
14 Chairman.

15 THE CHAIRMAN: Okay, break for fifteen  
16 minutes.

17 THE REGISTRAR: The hearing will take a  
18 15 minute recess.

19 ---Recess at 3:40 p.m.

20 ---On resuming at 3:57 p.m.

21 THE REGISTRAR: This hearing is again in  
22 session. Please come to order.

23 THE CHAIRMAN: Mr. Mondrow?

24 MR. MONDROW: Thank you, Mr. Chairman.

25 Q. Mr. Burke, I have one question about



1 something you said earlier. You said that my  
2 hypotheticals were unrealistic because the avoided cost  
3 was greater than the savings; is that right?

4 MR. BURKE: A. Yes, it struck me that  
5 way, because I expected that you were looking at a  
6 stream of saved energy and a stream of saved supplied  
7 energy, and the avoided cost per kilowatthours is  
8 typically anything slightly lower than the rate at this  
9 point in time.

10 Q. If you target an option, an  
11 efficiency option at winter peak, wouldn't the avoided  
12 costs for that option be greater than the savings?

13 A. Well, there are some measures that  
14 have low load factors, like space heating measures,  
15 that where when you save energy, you save it perhaps  
16 for 30 per cent of the year, and the effect is that the  
17 avoided cost is about 6 or 7 cents a kilowatthour. So  
18 in those circumstances you can end up in a situation  
19 where the avoided cost exceeds the rate, and that's  
20 what I said, you would have to have some pretty unusual  
21 load factors in order to end up in that situation.

22 You picked industrial customers, I  
23 believe, which tend to have very high load factors.  
24 And So if you put a piece of equipment in place that  
25 saves energy, it usually saves it for 80 per cent of

1 the year, and so you would actually have rates lower  
2 than the average. The avoided cost for an industrial  
3 load would actually be lower than the average avoided  
4 cost for the system.

5 So, that was why I said it would be in a  
6 very unusual circumstance where you would have a low  
7 load factor industrial load that you were saving in the  
8 winter. That would make it possible but it's -- well,  
9 it's unlikely in the EEI case.

10 Q. In the industrial sector.

11 A. In the industrial sector.

12 Q. Okay, thank you.

13 Let's talk about load shifting for a  
14 couple minutes. Perhaps, Mr. Shalaby, this is a  
15 question for you, I'm not sure.

16 There is a maximum amount of load  
17 shifting that is useful to the system; is that right?  
18 You can shift load until you can get it flat,  
19 relatively flat.

20 MR. SHALABY: A. Yes.

21 Q. And the optimum amount of load  
22 shifting is termed in Ontario Hydro's documents, "The  
23 Useful Potential," is that right? Just so I can use  
24 the term properly.

25 A. You can use the term.

1 Q. Thank you.

2 If you turn up Exhibit 25 at page E2,  
3 which is Appendix E, page 2 --

4 A. Could you repeat the page, please?

5 Q. Appendix E, page No. 2. I would just  
6 ask you to open it for reference. There is a sample  
7 calculation that is done there. If I understand the  
8 calculation correctly, I'm just going to run through it  
9 very quickly, you start with a spread between daytime  
10 peak and nighttime trough, you subtract from that the  
11 available peaking hydraulic, and then you further  
12 subtract the interruptibles, and you are left with the  
13 useful potential; is that right?

14 A. For the high day, that is the  
15 situation, yes.

16 Q. I just spoke with Mr. Harper before  
17 the break about interruptibles, and my impression was  
18 that interruptibles are primarily an emergency  
19 situation measure, as opposed to load shifting, which  
20 is something you want to permanently, to the extent  
21 possible, remould the load shape and get flatter loads  
22 all the time. I guess I'm wondering why you net out  
23 interruptibles when you determine what your potential  
24 load shifting is.

25 A. Well, we recognize that we do have a

1 certain amount of interruptible contracts, if you  
2 didn't net them out, you may be instituting programs  
3 that would get the same benefit two different ways.  
4 Only one is enough.

5 Q. But the interruptibles aren't an  
6 option that is supposed to be used every day or every  
7 winter day.

8 A. They are not.

9 Q. Whereas load shifting is an option or  
10 more accurately a description of a number of options  
11 that are meant to be put in place permanently and  
12 operate every day on a regular basis; is that right?

13 A. That is right. And the netting out  
14 of interruptibles is only done in the high days. If  
15 you look at the page E3, it shows that we net out  
16 interruptibles only in the high days, not every day of  
17 the year. The mid days and the low days do not have  
18 the interruptibles netted out.

19 Q. Does that calculation then assume  
20 that interruptibles will be used on every high day to  
21 flatten out the load shape?

22 A. In this calculation, it is assuming  
23 that.

24 Q. And in reality, Mr. Harper, is that  
25 how interruptibles will be used, every high day, to

1       flatten out the load?

2                   MR. HARPER: A. I think it depends on  
3       how you are defining your high day.

4                   Q. I'm asking you, it's your definition.

5                   MR. SHALABY: A. Maybe we could stick to  
6       the definition here. I think it is the highest five  
7       days in a month or something close to that. I can get  
8       the details for you. But in answer to you, no, I don't  
9       think interruptibles are interrupted in every high day  
10      in every month. That is not the case.

11                  Q. The load shifting that you want to  
12      accomplish, you don't just want to accomplish it for  
13      those five days, you want to accomplish it over a  
14      broader range of days; is that right?

15                  A. Yes.

16                  Q. And yet you net out the  
17      interruptibles from the calculation all together. I  
18      guess I'm just having a problem reconciling the  
19      function of the two options, load shifting on the one  
20      hand and interruptibles on the other, and why you net  
21      out emergency response from something that is going to  
22      be a permanent intervention. Can you reconcile that  
23      for me?

24                  A. Well, it's in recognition that on  
25      high days you have an added measure that can help you



1 meet demand. And we want to take account of that added  
2 measure. If needed, we will have an added measure in  
3 reserve.

4 Now, the net impact of all that, if you  
5 didn't include the interruptibles, is that the  
6 potential for load shifting would be slightly higher,  
7 and the numbers in Table 1 on page 83 would show what  
8 the potential is on medium day and low days. So, the  
9 potential would increase by something like 300  
10 megawatts or so.

11 Q. And would that be preferable?

12 A. Increasing the potential is not  
13 something that is preferable or not preferable. It is  
14 just that if you don't want to count the interruptibles  
15 as an instrument you can use on high days, you want to  
16 shift the load sufficiently that you don't even need to  
17 interrupt anybody, there would be an added potential to  
18 do so.

19 If you want to continue to count the  
20 interruptibles, whether it is because they are more  
21 effective or have higher degree of customer  
22 satisfaction, or they work together with load shifting.  
23 And that's the way we are doing it this time. We are  
24 counting both load shifting and interruptibles at the  
25 same time.

1 Q. Okay. I would like to ask a question  
2 about another area. If more load shifting were useful  
3 to the system, could Ontario Hydro get it? Is there a  
4 problem with getting more load shifting?

5 A. I don't know that we estimated sort  
6 of the maximum potential for load shifting, but I think  
7 our estimate is that there is probably more load  
8 shifting out there than we can use effectively.

9 Q. Okay.

10 A. Will there be a problem getting it?  
11 Well, it's going to be work getting it.

12 Q. When Ontario Hydro evaluates energy  
13 efficient options, the focus is on winter peak  
14 reductions; right?

15 A. When Ontario Hydro?

16 Q. Evaluates EEI options.

17 A. Well, we look at total customer  
18 savings, whether they occur in the winter or in the  
19 summer. But because we are a winter peaking utility,  
20 we naturally go to winter peaking savings as a start.  
21 That has been a start for us. But as you have heard  
22 the Panel show, that we are looking at cooling options  
23 as well.

24 Q. Yes. If we go a step further in our  
25 load remoulding attempt, if we could get load

1 reductions off peak because of efficiency options, and  
2 thereby increase the spread between peak and trough,  
3 more load shifting would be useful in that case; right?

4 A. Conceptually, yes. But of less value  
5 though.

6 Q. But of less value than the load  
7 shifting that we are after now, that thousand  
8 megawatts.

9 A. You have got to work on reducing the  
10 trough and work on dumping from the peak to the trough.  
11 It may be easier just to shave the peak.

12 Q. But if we have a flat load at one  
13 level because of load shifting, and then we enter  
14 another scenario where we have a deeper trough, and so  
15 we also get a flat load, but it is at a slightly lower  
16 level, don't we avoid more capacity then in the first  
17 scenario?

18 A. Yes, the lower the level of load, the  
19 less capacity you need.

20 Q. And following this reason then,  
21 shouldn't options that can -- that do target  
22 specifically off-peak load reduction be credited with a  
23 portion of avoided capacity costs?

24 A. Through what? Is there a second  
25 stage you are looking at? If you reduce off peak and

1 then load shift, is that what you are saying?

2 Q. That's right.

3 A. I haven't thought of it that way  
4 before.

5 Q. Okay. Panel, would you say it's true  
6 that Ontario Hydro is under significant cost pressures,  
7 generally speaking?

8 MR. WILSON: A. Such enthusiasm.  
9 Sure, yes.

10 Q. You would say that's true?

11 A. Yes.

12 Q. Thank you. Demand management, to the  
13 extent that it is successful, reduces revenues to  
14 Ontario Hydro; isn't that right?

15 A. Yes, it does.

16 Q. Would this exacerbate the cost  
17 pressures that Ontario Hydro is under?

18 A. Excuse me, let me add that I think it  
19 reduces revenues in short run. Clearly the money we  
20 spend on demand management has to come ultimately from  
21 customers, so that the revenues are collected for  
22 demand management. So that to the extent that revenues  
23 are reduced, it is because less electricity was used.

24 Q. Right.

25 A. Right.

1 Q. And you are saying that that is a  
2 short-run reduction.

3 A. There is upper pressure and rates on  
4 the short run, and possibly on the long run as well.  
5 But the overall cost of service is down, is lowered.

6 Q. So, you would get an exacerbation of  
7 the cost pressures that the corporation is under.

8 A. Yes, for certain in the short run.

9 Q. Ms. Fraser, has the energy management  
10 branch felt any of these conflicting tensions within  
11 Ontario Hydro? Has it influenced your operations at  
12 all, or have you had to deal with it in any way?

13 MS. FRASER: A. The conflicting tension  
14 with respect to the rate impact of demand management  
15 expenditures?

16 Q. Well, the conflicting tension that on  
17 the one hand we have existing now significant cost  
18 pressures. On the other hand, the more demand  
19 management we get, the further exacerbated those cost  
20 pressures become.

21 A. Well, it certainly was always made  
22 clear to me that we are supposed to spend any money  
23 wisely. It comes from the customers. It is not an  
24 infinite pot. That is just a general rule of doing  
25 business.



1                   With respect to the resources that we  
2           have been able to make the case for what we are going  
3           to be able to do and the time frame, what's reasonable  
4           as we move from where we were, say, three or four years  
5           ago to where we are now, we have been able to make the  
6           case for the resources that we have needed, and those  
7           resources have been forthcoming. Relative to other  
8           parts of the organization, the increases have been  
9           dramatic, where other parts of the organization have  
10          been looking at, in some cases, absolute reductions.

11                   Q. Do you think that this relatively  
12          large resource allocation is -- are you telling me that  
13          that is an indication of where Hydro's sentiments lie,  
14          in terms of demand management?

15                   A. Certainly the direction that I get is  
16          the sentiments are that demand management is top  
17          priority, and that we are supposed to go out and get  
18          all the economic demand management we can. And to the  
19          best of our ability, as fast as we can mobilize all the  
20          allies that we have talked about, all of the resources  
21          in the marketplace, move the market, get new products  
22          in and those -- those are the constraints that are  
23          probably a bit more pressing than, you know,  
24          availability of resources from demand management's  
25          point of view.

1 Q. And the fact that the more demand  
2 management you get, the tougher it will be in the next  
3 couple of years for Ontario Hydro to keep its financial  
4 picture healthy hasn't impacted at all on demand  
5 management in the energy branch?

6 A. No one has told me, sorry, you can't  
7 do program X, Y and Z, because it is going to have such  
8 and such an impact on rates. Certainly no one has ever  
9 said that to me. The fact that more programs we come  
10 up with and could do...

11 Q. Is there a general feeling then in  
12 Hydro that short-term pain for long-term gain is an  
13 appropriate salve?

14 A. Well, if by that you mean short-term  
15 rate increases for long-term lower costs of energy  
16 service in the province, that's definitely the basis on  
17 which we are working.

18 MR. MONDROW: Those are all of my  
19 questions, Mr. Chairman.

20 Thank you, Panel.

21 [4:15 p.m.] THE CHAIRMAN: Ms. Kleer, are you ready  
22 to go?

23 MS. KLEER: I guess I expected to have an  
24 hour...

25 THE CHAIRMAN: Well, if we don't get

1       done, we will finish tomorrow morning, but we can at  
2       least start now.

3                   MR. B. CAMPBELL: Mr. Chairman, just  
4       before Ms. Kleer does commence, there is, I guess, two  
5       matters I should record.

6                   One is that I have had a couple of  
7       conversations with Mr. Martin Campbell on behalf of  
8       OPHA, and he had indicated to me that he intended to  
9       cross-examine with respect to a description of certain  
10      kinds of health related work such as epidemiological  
11      studies that were generally done by Ontario Hydro.  
12      This was part of an overall interrogatory that got  
13      slotted into Panel 4, and he was interested in  
14      epidemiological work being conducted by Ontario Hydro.

15                  Having discussed that matter with him, I  
16      have reached an arrangement with him whereby his  
17      question about 'please provide a description about what  
18      epidemiological work is being referred to', is going to  
19      be treated as a supplementary interrogatory. I pointed  
20      out that that was sort of a part of a very broad  
21      question and that there would be nobody on this panel  
22      who could deal with that matter.

23                  So, we are dealing with it that way and  
24      he has asked me to advise you that that's satisfactory  
25      to him, and the short number of questions that he had

1 about that matter would now not be necessary for this  
2 panel.

3 Secondly, I can advise --

4 THE CHAIRMAN: When do you, if ever,  
5 expect there to be some evidence in that area, in the  
6 proponent's case?

7 MR. B. CAMPBELL: I think it will be in  
8 the course of some of the options panels where it's  
9 particularly relevant. I think certainly in the fossil  
10 and nuclear area, less so in the hydraulic.

11 I can tell the Board that there clearly  
12 have been a range of interrogatories on these matters  
13 and in this area, possibly in another area, where there  
14 is an exercise going together to try and kind of pull  
15 together some of the interrogatory information. These  
16 things sometimes start out in the course of looking at  
17 trying to get material ready for the witnesses and in  
18 this case, I think in this area, it may be one of the  
19 areas where, having pulled it together, we decided to  
20 package it up and provide it in a concise sort of  
21 overall way and then it could be spoken to somewhat  
22 more easily than wading through interrogatories.

23 So, the health and environmental is one  
24 area where we are looking at the possibility of  
25 packages in that respect.

1 I expect that another area where we will  
2 be doing that for Panel 8 is alternative electricity  
3 generating technologies. I expect there will be a  
4 document available two to three weeks on that, on that  
5 matter, which basically has done the same thing, which  
6 is pull together that kind of matter. And as pointed  
7 out in our Panel 5 witness statement, that will be  
8 spoken to in Panel 8.

9 MR. D. POCH: Perhaps Mr. Campbell could  
10 just indicate when the health and environment  
11 documentation will likely be available. It's obviously  
12 of interest of us, both for cross and for preparation  
13 of our cases.

14 MR. B. CAMPBELL: I think we are hoping  
15 that the -- I don't have quite as tight a grip on this  
16 information as I would like to respond to all of these  
17 questions, but I think the first one is intended to be  
18 compiled in respect of hydraulic matters, and with any  
19 luck should be available, as I understand it from Ms.  
20 Harvie, by the end of next week. It is, as I say, it's  
21 having taken a look at the result of an exercise that  
22 we put together for our own purposes, and we, I think,  
23 concluded, at least insofar as it's far enough along  
24 now, that we can reach a conclusion, that it might be  
25 of assistance generally to the hearing and it just



1 might facilitate things, the discussion of some of  
2 these issues.

3 My understanding is that, again,  
4 information that's been put out in interrogatories is  
5 also being gathered then for the subsequent option  
6 panels, and my expectation is that there will then be  
7 an equivalent package sort of compiling all of this  
8 information for subsequent option panels as we proceed.

9 Oh, the second matter I wanted to talk to  
10 you about was simply to record the fact that we were  
11 given today by Ms. Kleer the list of materials that she  
12 will be referring to in her cross-examination. I am  
13 not sure that the panel even has them yet.

14 MS. FRASER: Just.

15 MR. B. CAMPBELL: If they did, they were  
16 handed them at the break, but they have not had an  
17 opportunity to review them. I don't know whether that  
18 makes any difference in light of the time to how the  
19 Board wants to proceed. It may make a difference as to  
20 how efficiently the panel can proceed is my concern.

21 MS. KLEER: On that point, I think most  
22 of the interrogatories I will be referring to, I may  
23 get to them today. But if not, I could get them  
24 tomorrow. They are actually quite brief so it should  
25 not take...

1 THE CHAIRMAN: Why don't we get started  
2 with you and then we will stop around five o'clock.

3- MS. KLEER: If I may I would like to  
4 begin by filing as a new exhibit a short position paper  
5 that was put out for discussion by Moose River/James  
6 Bay Coalition, and I don't intend to cross-examine on  
7 it; I merely put it forward as my client's position,  
8 the Moose River/James Bay Coalition, that is, with  
9 respect to energy conservation. It's a very short  
10 position paper that my client will be addressing in  
11 their own evidence.

12 THE CHAIRMAN: That will be No. 313.

13 THE CHAIRMAN: 313.

14 ---EXHIBIT NO. 313: Position Paper, Moose River/James  
15 Bay Coalition.

16 THE CHAIRMAN: Just to make sure, Ms.  
17 Kleer, you are examining on behalf of the Moose  
18 River/James Bay Coalition group?

19 MS. KLEER: As well as Nishnawbe-Aski  
20 Nation, Treaty #3, Teme-Augama Anishnabai.

21 THE CHAIRMAN: And this position paper  
22 represents the views of all three?

23 MS. KLEER: The Moose River/James Bay  
24 Coaliton.

25 THE CHAIRMAN: Thank you.

1 MS. KLEER: In fact, just for a bit of  
2 further background on it, that paper was distributed to  
3 the aboriginal intervenors in this hearing, as well as  
4 to other environmental groups, so they are all aware of  
5 it and it's the subject of some discussion. I just  
6 merely put that on the record so that people are aware  
7 of what this paper is about.

8 I will also distribute the eight copies  
9 of the interrogatories I intend to refer to.

10 As I say, panel members, I will not be  
11 referring to that. You may read this at your leisure.

12 CROSS-EXAMINATION BY MS. KLEER:

13 Q. I guess my first question will be  
14 directed to -- and I apologize, but I don't know  
15 everyone who is on the panel. The third individual,  
16 sir?

17 MR. WILSON: A. I am Doug Wilson.

18 Q. Hello, Mr. Wilson.

19 It became clear during the course of the  
20 cross-examination by IPPSO... Thank you. I just was  
21 given a road map to the names of you people.

22 It became clear that there is no  
23 preference premium that is applied either to load  
24 shifting or to discount demand services; is that  
25 correct?

1 A. Yes, that's right.

2 Q. Now, I am a bit puzzled by that, to  
3 be honest. My understanding is that there a preference  
4 premium that is applied to EEI; is that correct?

5 A. Yes.

6 Q. And as well to hydraulic; is that  
7 correct?

8 A. Yes.

9 Q. Now, my understanding of why the  
10 preference premium is applied is in large part to give  
11 some meaning to the environmental preferences for the  
12 options. Is it the case that with respect to capacity  
13 interruptible load or what you now call discount demand  
14 services and load shifting, that these are not somehow  
15 environmently preferable?

16 A. To date we have treated them as  
17 distinct from measures which basically avoid the  
18 consumption of energy, or in the case of hydraulic,  
19 produce energy with environmental effects that are  
20 noticeably less now than either nuclear power or  
21 burning fossil fuels.

22 Perhaps Mr. Shalaby can elaborate, if he  
23 wishes.

24 Q. Mr. Shalaby?

25 MR. SHALABY: A. Yes, in the whole that

1 is the rationale for the premium. I think we discussed  
2 it at length in Panel 3. But it is what you said, it's  
3 to give substance to the preference for certain  
4 resources that Hydro indicated in its strategy that it  
5 gives preference to.

6 Q. But in fact, with respect to both  
7 load shifting and discount demand services, they  
8 clearly push back the need for new supply and therefore  
9 they would be, in some senses, environmentally  
10 preferable as well; is that not the case?

11 A. They have some environmental impact  
12 in the sense of reducing supply, but not as much as  
13 environmental -- as EEI, because they don't have as  
14 much energy reduction impact as other options do.

15 So yes, they do have some impact but  
16 nowhere near the high load factor EEIs.

17 Q. So, do I take it that the fact that  
18 you apply a 10 per cent preference to hydraulic and not  
19 to capacity interruptible load and load shifting means  
20 that somehow developing hydraulic is more preferable  
21 than developing load shifting and capacity  
22 interruptible load?

23 A. Developing hydraulic as a renewable  
24 resource, we said in our strategy that we will pursue  
25 renewable Ontario resources. Hydraulic gets a



1 preference for being renewable and gets a preference  
2 for being an Ontario resource.

3 Q. I appreciate that. What I am asking  
4 is, are you saying by applying a 10 per cent preference  
5 premium to hydraulic as opposed to capacity  
6 interruptible load and load shifting, that hydraulic is  
7 preferable, developing hydraulic is preferable to  
8 capacity interruptible load and load shifting?

9 A. No, I am not saying that.

10 I am saying that we give preference to  
11 demand management and we give preference to renewable  
12 Ontario resources.

13 In the family of demand management,  
14 interruptible loads and load shifting did not get the  
15 same treatment in terms of the 10 per cent premium  
16 adder as the efficiency options did.

17 Now, I am not sure that they needed that  
18 to be fully implemented. In my judgment, the 10 per  
19 cent premium on those options is not a significant  
20 omission in their implementation. It doesn't detract  
21 very much from the attainment of their full potential.

22 We fully intend to get the full potential  
23 of load shifting. And if we do need to add the 10 per  
24 cent to get the full potential, that might be a  
25 consideration in the future.

1                   It's really a theoretical kind of  
2       consideration, because we expect to get the full  
3       potential without the premium.

4                   Q.   Well, I understand from load shifting  
5       that there is a potential out there of 1200 megawatts,  
6       but in fact your target for 2000 is 1000 megawatts; is  
7       that correct?

8                   A.   That is correct, yes.

9                   Q.   So, by applying a 10 per cent  
10      preference premium you wouldn't be getting more than  
11      your 1000 megawatts?

12                  A.   The reason for going slightly below  
13      the opportunity, the system opportunity, as I described  
14      in my direct evidence, is the uncertainties associated  
15      with the thermal load curve with the impact of  
16      different rate structures on the load shapes. There  
17      are many uncertainties associated with exactly how you  
18      level off demand, so we thought targeting a thousand  
19      out of a useful 1200 is a prudent thing to target for.  
20      [4:29 p.m.] We target for a thousand and see where we  
21      are at that time.

22                  Q.   Have you done any studies to say that  
23      that 200 megawatt difference between 1200 and 1,000 is  
24      necessary to deal with the uncertainties that you are  
25      talking about, or is that just a ballpark figure that

1       you have chosen?

2                   A. It is a judgment call.

3                   Q. And just so I am clear on this point  
4       in my own mind, are load shifting and capacity  
5       interruptible load both screened against avoided costs?

6                   A. As Mr. Harper just indicated in the  
7       last bit of cross-examination, the amount of discounts  
8       given for interruptibles is linked to avoided cost,  
9       yes.

10                  Q. Thank you. Mr. Harper, you spoke  
11       when you were being cross-examined by Mr. Rodger about  
12       your time-of-use rate experiment experiment with 500  
13       residences to see what could be done in terms of  
14       residential load shifting. And I believe your  
15       preliminary results showed a 5 per cent shift to  
16       off-peak hours was possible in residential, at least in  
17       that test group; is that correct?

18                  MR. HARPER: A. Yes. It was estimated  
19       that you could get a 5 per cent shift from, say, the  
20       winter peak period to the winter off-peak period.

21                  Q. Now, if you are exploring that  
22       option, ie. residential load shifting, how does that  
23       affect your 1,000 megawatt target?

24                  A. I think as I outlined in my direct,  
25       if we look at the total load shifting that we think

1 could be achieved if you were to apply time-of-use  
2 rates to all customers in the province, you would get  
3 something in excess of the 1,000 megawatt target.

4 So, that you really don't have to apply  
5 it and really then, it is a matter of where is it  
6 economic to to apply it so that in total you get up to  
7 1,000 megawatts that we are looking for?

8 Q. Can we turn briefly to Exhibit 25 and  
9 I will ask these questions to you, Mr. Harper. And  
10 Exhibit 25 is the demand management in the 1989  
11 Demand/Supply Plan, and if we can turn to page 39.

12 Under 3.2, there is a description there  
13 of the useful potential and the statement is made in  
14 the first paragraph, I believe -- oh, pardon me, in the  
15 second paragraph, that the availability of hydraulic  
16 generation reduces the usefulness of other load  
17 shifting. Load shifting is only useful if it flattens  
18 the thermal load curve, not just total load.

19 Now, has Ontario Hydro ever considered  
20 modelling the potential for load shifting as though  
21 some of the now available hydraulic generation were, in  
22 fact, not available and, in fact, you decommission some  
23 of the existing hydraulic plants? Has that ever been  
24 done?

25 MR. SHALABY: A. I don't think we have

1 done that in any detailed way, but if you want to get  
2 an idea about that, you just subtract the amount of  
3 peak hydraulic or add that amount of peaking hydraulic  
4 to the useful potential for load shifted.

5 Q. If we can turn to page 45 of the same  
6 exhibit under Section 3.3.3, supply management.

7 Now, it says there that load shifting  
8 options are not all on the demand side and hydraulic  
9 generation is an option. And then it goes on to say in  
10 the third sentence there:

11 Several smaller sites, ie. hydraulic  
12 sites, are available and it is considered  
13 that these will be developed when  
14 calculating the need for other load  
15 shifting.

16 Now, first of all - I guess I should ask  
17 these of Mr. Harper - the several smaller sites that  
18 are referred to there, what is being referred to  
19 exactly?

20 MR. HARPER: A. I am sorry, I don't  
21 know.

22 Do you know, Mr. Shalaby?

23 MR. SHALABY: A. What line is it again?

24 Q. It is in the fifth line of Section  
25 3.3.3. I am wondering whether or not the several



1 smaller sites refers to the sites in the hydraulic  
2 plan.

3 A. I suspect so, yes.

4 Q. Now, I was trying to understand this  
5 statement and I will just pose the question: Does this  
6 statement mean that the target of a thousand megawatts  
7 attainable that we have talked about for load shifting  
8 by the year 2000 assumes that these smaller sites will,  
9 in fact, be developed? Is that how I read that  
10 statement?

11 A. Yes.

12 Q. Isn't that somewhat prejudging the  
13 issue? We don't know whether these smaller sites are  
14 going to be approved or not.

15 A. Well, many of the planned components  
16 are projecting what we see as our proposal. Our  
17 proposal includes some hydraulic sites for costing  
18 purposes, for energy production purposes, for avoided  
19 cost purposes and also for calculation of load shifting  
20 potential.

21 But you are quite right, if those sites  
22 are not approved, then the plan will have to be  
23 adjusted. We just thought we will put together a  
24 coherent integrated plan that has all the pieces fit  
25 together in a coherent way. That is the reason for

1 putting it together that way.

2 Q. Would you be able to get for me what  
3 the load shifting potential would be if you didn't  
4 assume that those sites were going to be developed?  
5 Could I get that as an undertaking? Perhaps you can  
6 figure it out quickly.

7 A. If I can't do it inside a minute, we  
8 will do it as an undertaking.

9 THE CHAIRMAN: Number?

10 THE REGISTRAR: No. 261.58.

11 THE CHAIRMAN: No, an undertaking.

12 THE REGISTRAR: Oh, undertaking, pardon  
13 me.

14 MR. SHALABY: Mr. Lucas has great  
15 confidence in my ability to do things under a minute.

16 MS. KLEER: Pardon me, could I get that  
17 number again?

18 THE REGISTRAR: 267.15.

19  
20 ---UNDERTAKING NO. 267.15: Ontario Hydro undertakes to  
21 provide the load shifting potential if  
the small hydraulic sites are not  
developed.

22 MS. KLEER: Thank you.

23 Q. If we can turn briefly back to page  
24 39 of the same exhibit, under Section 3.2 again, the  
25 first paragraph, it states there, the second sentence

1 from the bottom, the majority --

2 MR. SHALABY: A. Can I refer you so we  
3 don't have too many undertakings on my neck here? I  
4 would rather do something else in the evenings.

5 Appendix E shows how the average peak  
6 hydraulic increases from about 1943 in the year 2000.  
7 That can be seen in -- Table A, for example, shows  
8 average peak hydraulic to be 1643.

9 Q. What page of Table A, I am sorry -  
10 E7?

11 A. Table A is at page E7.

12 Q. I am sorry, could you go through this  
13 again?

14 A. It shows the amount of peaking  
15 hydraulic in the year 2000. I am saying the appendix  
16 shows the amount of peaking hydraulic in the year 2000  
17 and the amount of peaking hydraulic in the year 2008 to  
18 be increasing by about 700 megawatts. If you go  
19 through that appendix, the tables will indicate that.

20 Is that the kind of information you are  
21 looking for?

22 Q. Well, actually, I was assuming that  
23 we were talking about the period of 1990 to 2000 as  
24 being the period for which you estimated the thousand  
25 megawatts of load shifting?

1                   A. That's correct, yes. I think the  
2                   only hydraulic development there that is considered  
3                   peaking would be the Mattagami. So the capacity of the  
4                   Mattagami would be roughly the increase in load  
5                   shifting potential as --

6                   Q. So you are saying if you didn't get  
7                   approval for the Mattagami --

8                   A. That would be added useful potential.  
9                   As the first order of magnitude, that would be, yes.

10                  Q. And are you saying that you could get  
11                  that load shifting potential?

12                  A. No, I didn't say that. That would be  
13                  a useful potential. I don't know whether we can  
14                  achieve the thousand plus the equivalent of the  
15                  Mattagami all before the year 2000. I don't know that.

16                  Q. Does anyone else on the panel know  
17                  that?

18                  I will repeat my question: Does anyone  
19                  else on the panel --

20                  MR. WILSON: A. I don't think the rest  
21                  of us know the size of the Mattagami development,  
22                  so ...

23                  MS. KLEER: All right. Well, then, I  
24                  will reserve that until I get to Panel 6 then.

25                  I take it then that the undertaking

1 267.15 has been satisfactorily dealt with and we can  
2 remove that. I am satisfied with that.

3 THE CHAIRMAN: All right.

4 MS. KLEER: Q. Now, before I was  
5 interrupted, Mr. Shalaby --

6 MR. B. CAMPBELL: Just a minute. I am  
7 afraid there is going to be a little gap here if I  
8 don't step in. I think we have a problem in that we  
9 better find out so that whoever on the panel wants to  
10 speak to it can address your question about ability to  
11 achieve extra load shifting because there is going to  
12 be nobody on Panel 6 who, once that number is given, is  
13 going to be able to answer your question about  
14 achieving it.

15 I don't want to get into one of these  
16 'you should have asked then because I was going to tell  
17 you later' kind of situation.

18 So, could --

19 MR. SHALABY: Well, the Mattagami is  
20 about 379 megawatts. That is shown on page 12-8, Table  
21 12-2.

22 MR. B. CAMPBELL: And I think, Mr.  
23 Chairman, in fairness - although the witnesses may not  
24 appreciate me saying this - if anyone is going to be  
25 able to speak to the ability to implement programs to



1       attain additional load shifting, it is this panel, not  
2       subsequent panels.

3                   THE CHAIRMAN: I take it this is a  
4       special kind of load shifting.

5                   This is making use of new hydraulic; is  
6       that right?

7                   MR. B. CAMPBELL: No. Unless I have  
8       completely misunderstood, as I understand it what is  
9       being posited is that Mattagami does not go ahead -  
10      Mattagami being peaking - that additional load -- the  
11      question that Ms. Kleer is raising is whether, in the  
12      judgment of the panel, it is possible to put in place  
13      additional load shifting efforts that would result in  
14      shifting of load into the valley equivalent to the  
15      peaking capability of the Mattagami which is no longer,  
16      as I understand the hypothetical, in place.

17                  THE CHAIRMAN: I see.

18                  MR. B. CAMPBELL: Do I have that  
19      correctly?

20                  MS. KLEER: That is correct, Mr.  
21      Campbell.

22                  Q. And with that question, I need not  
23      say it because I couldn't say it any better, could  
24      someone - I guess it would be you, Mr. Harper - could  
25      you answer that question?

1 MR. HARPER: A. I am trying to, in my  
2 own mind, translate how that 400 megawatts would change  
3 the total system potential - like, you know, what is  
4 the potential opportunity there for load shifting?  
5 Does that mean --

6 MR. SHALABY: A. Again, as a first order  
7 of magnitude, it would be about, instead of meeting  
8 peak demand with hydraulic, 400 megawatts of hydraulic  
9 during the peak. You would want to shift that amount  
10 into the valley.

11 Q. Do you need some time to consider  
12 this and perhaps we could --

13 A. Maybe it is late in the day.

14 Q. I don't think we are going to finish  
15 today, so maybe we could come back and address this  
16 tomorrow.

17 A. Okay.

18 DR. CONNELL: May I just add to this, I  
19 am still floundering a little bit in the reference on  
20 page 45, the reference to 'other load shifting'. I  
21 haven't been able to put that in context yet. And  
22 perhaps if we could simply clarify what is that  
23 allusion to 'other load shifting'; other to what? Does  
24 that mean over and above the 1,000?

25 And the hydraulic provisions in the DSP,

1 it is some imagined need for load shifting beyond that  
2 level, is it? I am happy to leave that with you for  
3 parsing later.

4 MR. SHALABY: I suspect it is in addition  
5 to the hydraulic developments. That is my suspicion  
6 here. If it is any different, I will confirm that.

7 DR. CONNELL: It seems to me to read that  
8 way.

9 MR. SHALABY: Yes.

10 MS. KLEER: Q. So do you have the  
11 question clear, Mr. Harper?

12 MR. HARPER: A. Yes, I believe so.

13 Q. All right. Then we will come back to  
14 that tomorrow.

15 All right, then just one further question  
16 on load shifting relating to weekly and annual load  
17 shifting. At page 39, again still of this exhibit,  
18 under Section 3.2, it is indicated that annual load  
19 shifting is not explored at all by Ontario Hydro.

20 Just for my understanding, could you  
21 explain, Mr. Harper, what annual load shifting means?

22 A. I think within the context they are  
23 talking about it here, they are talking about shifting  
24 load, say, from the wintertime to the summertime  
25 moving across the year.

1 Q. And that is simply not workable in  
2 our kind of climate.

3 Is that the main reason why Ontario Hydro  
4 doesn't look at that?

5 A. I think the idea is if you are  
6 thinking about what types of activities customers would  
7 want to shift, the idea of postponing and doing that  
8 particular activity from the wintertime to the  
9 summertime if really, the service is something you want  
10 in the wintertime is something we didn't see was very  
11 practical.

12 [4:45 p.m.] The other thing was is I believe there is  
13 an interrogatory response that indicates that overall  
14 the actual opportunity from winter to summer load  
15 shifting is not that large. Something in the order of  
16 200 megawatts.

17 Q. Now, with respect to weekly load  
18 shifting, you state that, or this exhibit states that  
19 there is -- the majority of practical load shifting  
20 options shift load daily, and to a small extent weekly,  
21 and then your discussion concentrates on daily load  
22 shifts.

23 Do I understand that the load shifting  
24 numbers that we are looking at in your plan of a  
25 thousand megawatts includes some weekly load shifting,

1 or not?

2 A. There is certain allowance in a  
3 sense, and we are trying to draw on studies that are  
4 done in other jurisdictions in terms of looking at  
5 price differentials between the peak and the off-peak.  
6 To a great extent most jurisdictions define weekends as  
7 being off-peak periods, similar to we've done it. Then  
8 if you look at the type of response that has taken  
9 place, the idea is that shifting could probably occur  
10 either into the night time or into the weekend.

11 I think what we are trying to address  
12 here is that for most practical purposes shifting is  
13 done from the daytime to the night time. Just again a  
14 sense of, if I'm an industry, and I'm trying to  
15 maintain a level of production, and I'm going to shift  
16 production, the easiest way is to shift my  
17 production -- some of my production or certain aspects  
18 of my production into the off-peak period, store that  
19 material so that it can subsequently be used during  
20 peak period, and other steps in the production process.  
21 To only produce on the weekend and try and use it  
22 during the week would obviously require significantly  
23 more storage capability. So you run into limitations  
24 like that.

25 Also to do it on a weekend, you would



1 have to be a customer that is operating on the weekend  
2 as well as during weekdays.

3 Q. Have you explored this weekly load  
4 shifting option with the customers? I understand you  
5 have 40 customers that -- sorry, that is capacity  
6 interruptible load.

7 With the customers that are now looking  
8 at load shifting, have you explored the option of  
9 weekly load shifting with them in any great depth?

10 A. No, we haven't. I think that is  
11 something that they will probably themselves get around  
12 to looking at very specifically, particularly when they  
13 start looking at the load shifting program that has  
14 been instituted for the industrial customers, in a  
15 sense of looking at what sorts of storage facilities  
16 they could be installing, what the capital costs of  
17 those, and considering the incentives Hydro is willing  
18 to offer.

19 But I think it would first be a day/night  
20 type storage, and then they would have to look  
21 incrementally beyond that. Is there any weekend type  
22 shifting that could take place as well. But I think  
23 that would come second.

24 Q. So, I understand that the programs  
25 that you have now for load shifting, the time-of-use

1 rates and the thermal cool storage program, which is  
2 looked at in the commercial sector, neither of those  
3 address weekly load shifting at this point, is that  
4 correct?

5 A. Well, they address weekly load  
6 shifting in the sense that the rates are lower for both  
7 Saturdays and Sundays and statutory holidays. I think  
8 maybe on the thermal cool storage may be a good example  
9 in the sense of typically the commercial building there  
10 is cooling -- I guess it is either through ice or cold  
11 water, storing basically cold air or some meaning of  
12 cold during the off-peak period, so that they can then  
13 draw on it during the peak period to cool the building  
14 and not have to actually run their air conditioning to  
15 the same extent during the peak period, if they didn't  
16 have that thermal cold storage facility there.

17 To get into weekly storage of the cooling  
18 would obviously require significantly more storage. I  
19 think Ms. Fraser can comment in terms of the people  
20 that looked at that at all.

21 MS. FRASER: A. Actually, they are  
22 depending on the requirements of the building and the  
23 operating characteristics. The operating strategy for  
24 thermal cool storage may include sort of super charging  
25 on the weekend and less charging during the week

1 relative to those, reflecting the off-peak charges.  
2 Our program doesn't restrict their use of off-peak on  
3 weekends, and we encourage where they can to certainly  
4 do that as part of charging of thermal cool storage  
5 system.

6 Q. All right, I have one brief question  
7 on the supply side impacts. Now, I understand, from  
8 reviewing Mr. Poch's cross, that the supply side  
9 impacts of demand management have been deferred to the  
10 supply side panels, and perhaps I can confirm that with  
11 Mr. Campbell.

12 Is that your understanding of how it's  
13 going to work in terms of supply side impacts of demand  
14 management? I can refer you to the reference in the  
15 transcript. I just want to make sure that that is the  
16 case, because we are very interested in those.

17 MR. B. CAMPBELL: I think there was  
18 certainly reference to a study that was filed that  
19 looked at the Demand/Supply Plan with and without the  
20 demand management component, and indicated what the  
21 supply side impacts would be, if the demand management  
22 component was removed. Is that the reference?

23 MS. KLEER: That's the reference. I'm  
24 just trying to confirm that I can ask my questions  
25 relating to that in the supply side option panels.

1 MR. B. CAMPBELL: Yes. I don't believe  
2 it would be on the individual option panels as we went  
3 through, but certainly in terms of discussing how an  
4 overall plan would look, if demand side measures were  
5 not pursued or were pursued less vigorously, that is  
6 certainly something that our integration panels,  
7 particularly Panel 11, would be prepared to deal with.

8 THE CHAIRMAN: The distinction is that  
9 this panel is dealing with the assessment expectations,  
10 capability, whatever, the demand management programs,  
11 and the supply panels will be dealing with the impact  
12 of success or failure of those programs on the need for  
13 further supplies.

14 MR. B. CAMPBELL: Supply side supplies.

15 THE CHAIRMAN: Is that --

16 MR. B. CAMPBELL: That's absolutely  
17 correct.

18 THE CHAIRMAN: That seems to be the  
19 distinction.

20 MS. KLEER: That's fine. As long as  
21 that's clear.

22 Q. I have one question relating to the  
23 availability of information on supply side social  
24 environmental effects.

25 In the Coalition of Environmental Groups,



1 Exhibit 270, they supplied a copy of the supply side  
2 environmental effects of Ontario Hydro's demand  
3 management plan, which was part of the PCRD, and I  
4 think I have the reference, but it indicated in that  
5 paper that the supply side social impacts were not  
6 going to be dealt with in that paper, and they were  
7 going to be dealt with at a later time, and they were  
8 going to be put into another paper.

9 Do any one of you have familiarity with  
10 the workings of that paper or the putting together of  
11 that paper and know when it might come out?

12 MR. B. CAMPBELL: No, I don't know why --

13 MR. SHALABY: I think we would rather see  
14 the words on that.

15 MR. B. CAMPBELL: Perhaps if I can look  
16 at the reference with Ms. Kleer at the close of the  
17 hearing today, we will sort out exactly what is being  
18 referred to, and if there is anything else coming, we  
19 will get whatever information we have about the  
20 timetable for that. I'm not exactly clear on the  
21 reference.

22 MS. KLEER: That's fine with me.

23 I am actually entering into a fairly  
24 substantial area, so if we could end there.

25 THE CHAIRMAN: All right. Just roughly,



1       how long do you expect?

2                   MS. KLEER: I suspect I will be half an  
3       hour.

4                   THE CHAIRMAN: And so you will start at  
5       10:00, and then the Municipal Electrical Association  
6       will start after you finish. They expect to spend most  
7       of tomorrow, I gather, is that right?

8                   MR. YATCHEW: Yes, Mr. Chairman.

9                   THE CHAIRMAN: All right. We will  
10      adjourn then until tomorrow morning at ten o'clock.

11                  THE REGISTRAR: The hearing will adjourn  
12      until tomorrow morning at 10:00.

13      ---Whereupon the hearing was adjourned at 4:54 p.m. to  
14      be resumed on Tuesday, September 24, 1991, at 10:00  
15      a.m.

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